Inverse case attraction in Moksha Mordvin relative clauses and the nature of Merge

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Mariia Privizentseva

Gutachter:

Prof. Dr. Gereon Müller
(Institut für Linguistik, Universität Leipzig)

Prof. Dr. Rajesh Bhatt
(Department of Linguistics, University of Massachusetts at Amherst)

Dr. habil. Fabian Heck
(Institut für Linguistik, Universität Leipzig)

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Abstract

Relative clauses with inverse case attraction is a type of relative clauses where the head of the relative clause shows case assigned to the relativized position inside the relative CP and the relative construction occupies a position on the left periphery. This work investigates relative clauses with inverse case attraction in Moksha, a Finno-Ugric language. It brings the following results. First, relative clauses with ICA are externally-headed relative clauses derived by the raising derivation. Their left-peripheral position results from the movement of the relative CP, not base generation on the left. Second, raising derivation is part of natural language syntax and it co-exists with the head-external structure. Third, raising derivation includes projecting movement of the head of the relative clause, which is derived under projection by selection labeling algorithm combined with the possibility of the upward search. Fourth, obligatory left-peripheral position of the relative clause instantiates a type of derivation where some constituent is formed at the intermediate stage, but must be destroyed before the derivation terminates. I call such patterns forced ex-situ effects and show that they are widely attested cross-linguistically. They follow if selection applies not only for category, but also for other active features of a syntactic object. Overall, this work shows that projecting movement as well as forced ex-situ effects are best derived in the model where Merge is feature-driven, features on syntactic objects are organized in ordered stacks, and labels of newly formed constitutes are determined under projection by selection algorithm.

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Abbreviations used in glosses

1,2,3	1st, 2nd, 3rd person
ABL	Ablative
ACC	Accusative
ADD	Additive particle
AGR	Agreement
ART	Article
ATT	Attenuative
ATTR	Attributive
AVR	Avertive
CAR	Caritive
CAUS	Causative
CL	Clitic
CN	Connegative
COLL	Collective
COM	Comitative
COND	Conditional
CONV	Converb
CSL	Causalis
DAT	Dative
DEF	Definite
DIM	Diminutive
EL	Elative
EQU	Equative
F	Feminine
FREQ	Frequentative
FUT	Future
GEN	Genitive
ILL	Illative
IMP	Imperative
IMPF	Imperfect
IN	Inessive
INCH	Inchoative
INCP	Inceptive
INDEF	Indefinite
INF	Infinitive
INT	Intensifier
IPFV	Imprefective
LAT	Lative
LOC	Locative
M	Masculine
NEG	Negation
NEX.EX	Existential negation
N	Neuter
NOM	Nominative
NPST	Non-past
NZR	Nominalizer
O	Object
OBL	Oblique
OPT	Optative
ORD	Ordinal
PASS	Passive
PL	Plural
POSS	Possessive
PROH	Prohibitative
PROL	Prolative
PRON	Pronoun

PRS	Presence
PST	Past
PTCP	Participle
RES	Resultative
S	Subject
SG	Singular
SMLF	Semelfactive
TAM	Tense aspect mood marker
TMPR	Temporal case
TRANS	Translative
VOC	Vocative

Chapter 1

Introduction

1.1 Overview

This dissertation is on inverse case attraction, a niche phenomenon attested in Moksha relative clauses, on the syntax of relativization, and on the elementary syntactic operations Merge and Labeling.

It starts as an empirical investigation of relative clauses with inverse case attraction (ICA) in Moksha. These relative clauses are peculiar in that their heads are marked for a case assigned to a corresponding participant inside the relative CP and the relative clause itself is obligatorily positioned on the left periphery; see (1).

(1) [[head-α rel.pron-α ... case.assigner$_{[\text{case: }\alpha]}$ ...] ... case.assigner$_{[\text{case: }\beta]}$ ...]

Despite being a comparably rare phenomenon, ICA has been a subject for an intensive research and essentially all possible relative clause structures were assigned to it in different studies: Relatives with ICA were argued to represent correlatives (see Pittner (1995), Bhatt (2005), Georgi & Salzmann (2017), and also Bianchi (1999, 2000b)), regular internally-headed relatives (see Abramovitz (2021)), and regular externally-headed relatives (see Deal (2016)). The obligatory left-peripheral position of such relative clauses also received different analyses: It was argued to result from base generation on the left (see Deal (2016)) or from movement (see Abramovitz (2021)).

On the basis of the Moksha data, I will argue that relatives with ICA are externally-headed. I also show that the left-peripheral position of the relative clause is derived by movement. My research thus contributes to a better understanding of this particular phenomenon.

From a broader theoretical perspective, relative clauses with ICA plaid a role in the development of approaches to syntax of relativization: Under ICA, the case marking of the head comes from inside the relative clause. This constitutes essentially the single non-interpretative argument for the raising derivation of relative clauses (see Schachter (1973), Vergnaud (1974), Kayne (1994), Sauerland (1998, 2003), Bianchi (1999, 2000b), Bhatt (2002), De Vries (2002), Donati & Cecchetto (2011), and Sportiche

(2017)). Under this derivation, the head of the relative clause is first merged inside the relative CP and moves to the position where it is realized.

Applying standard connectivity diagnostics to relative clauses with ICA in Moksha, I show that diagnostics based on idiom interpretation, anaphor binding, and condition C pattern together and confirm the relative CP-internal origin of the head noun. The phenomenon then helps to determine the set of diagnostics reliable for testing the structure of relative clauses. The data show that variable binding does not show the correlation with the case on the head, which as I suggest implies that variable binding as it stands is not a reliable diagnostic for the relative clause structure.

Besides relative clauses with ICA, Moksha also has regular externally-headed relative clauses. The heads of these relative clauses are marked by the case from the main clause. The comparison of these two types of relative clauses will show that two types of generation are required for relative clause (see Sauerland (1998, 2003), Bhatt (2002), Harris (2008)), and that the raising derivation co-exists with the head-external structure. More generally, the analysis provides yet another case where superficially similar phenomena have distinct syntactic analyses.

Further investigating the syntax of raising, I show that the final position of the raised head is outside of the relative CP. I suggest that this is best accounted for if the raising derivation involves projecting movement: The head of the relative clause moves from the CP-internal position and projects in its landing site. This follows from projection by selection labeling algorithm (see Chomsky (1995b), Adger (2003) as well as Stabler (1997)) combined with the possibility of upward search (see Wurmbrand (2012), Zeijlstra (2012), Bjorkman & Zeijlstra (2019), i.a.) and an assumption that syntactic objects can be themselves selected before all of their merge features are discharged.

While Moksha relative clauses with ICA instantiate the raising derivation, the raising derivation was also argued to underlie relative clauses with external (i.e., regular main clause) case in other languages. I suggest that the difference in case marking follows from different orderings of the case probe and other features on the head. This provides further evidence that a language specific fixing of an initially indeterminate order of elementary operations may underlie parametrization (cf. Georgi (2017) and Murphy & Puškar (2018)). This also opens up a new approach to case overwriting phenomena and allows to account for them without actual overwriting of an assigned case value.

As mentioned earlier, another peculiar property of relative clauses with ICA in Moksha is their obligatory position on the left periphery that results from the movement to the left, not base generation there. I suggest that the obligatory displacement of relative clauses with ICA is an instance of a general pattern occurring in derivations of some linguistic phenomena and I call it a forced ex-situ effect. It involves building a constituent that must be destroyed before the derivation terminates. I

argue that forced ex-situ effects are best derived by introducing second order selection features: Selection applies not only for the category but also for further active features of a selected object. I also explore other cases of forced ex-situ effects. These are split topicalization in German (see Ott (2012, 2015)), relative pronouns (see Aoun & Li (2003), Heck (2005), Salzmann (2014)), resumptive pronouns and doubled clitics under the Big-DP approach (see Uriagereka (1995), Boeckx (2003)), and wager-class verbs (see Postal (1974), Kayne (1984)). I show that the analysis based on second order selection features extends to these other cases as well, while the existing alternative relying on the non-deterministic labeling algorithm (see Chomsky (2013, 2015)) does not cover all instances of forced ex-situ under one approach. This undermines the alternative and more generally takes some empirical foundation from Chomsky's novel labeling algorithm.

The main theoretical innovations of this dissertation are the analysis of projecting movement and the possibility of the second order merge features. They both rely on the projection by selection labeling algorithm. After reviewing other approaches to labeling and existing criticisms of projection by selection, I conclude that projection by selection approach to labeling must be on the right track.

I will now proceed with the background on Moksha and relative clauses with ICA.

1.2 Background

1.2.1 Moksha

The goal of this section is to introduce a reader to the Moksha language. The section contains a discussion of Moksha's areal and genetic properties, a brief overview of existing grammars and dictionaries that were extremely useful at earlier stages of my research, a description of methodology used for data collection, transcription, some glossing conventions as well as basic properties of Moksha grammar such as nominal and verbal inflectional categories, morpho-syntactic alignment, word order. This section (and especially its first part) is largely based on the introductory chapters (see Kholodilova (2018) and Korjakov & Kholodilova (2018)) of the recent Moksha grammar (see Toldova & Kholodilova (2018)) and the reader is invited to consult them for further details.

Moksha belongs to the Uralic language family. Internal classification of Uralic languages remains largely debated. According to a traditional approach (see, e.g., Donner (1879)), Moksha is classified as follows: Moksha < Mordvin < Volga-Finnic < Finno-Volgaic < Finno-Permic < Finno-Ugric. The existence of the Volga-Finnic group that comprises Mordvin and Mari languages is however usually rejected in a modern work (cf. Janhunen (2009), Michalove (2002)). The bigger Finno-Volgaic branch that also includes Finnish and Sami is also often argued against (see Collinder (1965)).

Finno-Permic and Finno-Ugric subdivisions appear to be better motivated (see Janhunen (2009)), but generally none of the subdivisions inside the Uralic language family is universally accepted (see Salminen (2002)).

The language closest to Moksha is Erzya. These two languages build a group of Mordvin (also Mordvinic, Mordovian, or Mordvinian) languages and in some grammatical descriptions are viewed as dialects of one Mordvin language (see Evsev'ev (1929/1963) and Zaicz (1998)). Both Erzya and Moksha are used mainly in Republic of Mordovia, Russia. Around 400.000 people indicated that they speak one of the Mordvin languages according to a population census in 2010. The data of the census do not allow to estimate a number of Erzya and Moksha speakers separately, because native speakers identify their language as simply 'Mordvin' in most cases. Despite a significant number of speakers, UNESCO Atlas of the World's Languages in Danger[1] classifies Erzya and Moksha as 'definitely endangered' because a number of speakers gradually decreases and children tend to not acquire these languages.

The first systematic research on Mordvin that is currently available dates back to the XIX century; see Moksha grammars by Ornatov" (1838) and Ahlquist (1861). Multiple detailed grammars and shorter sketches were written later in XX century; see Evsev'ev (1929/1963), Potapkin (1949), Koljadënkov (1954), Koljadënkov & Zavodova (1962), Babuškina (1966), Feojktistov (1966, 1975, 1993), Cygankin (1980), Zaicz (1998), Bartens (1999), and László (2011). In addition to grammars, there are also dictionaries on Mordvin languages. In the current work, I used the Moksha-Russian dictionary by Serebrennikov, Feojktistov, & Poljakov (1998), Moksha-Russian and Russian-Moksha dictionary by Ščankina (1993), and Russian-Moksha-Erzya dictionary by Ščankina, Kočevaktin, & Mišina (2011).

Moksha data presented in this dissertation were collected in villages Lesnoe Cibaevo and Lesnoe Ardaševo, Temnikovskij district. These villages are in the area of central Moksha dialect that is the basis for the Standard Moksha language (Feojktistov (1990)). All native speakers who participated in this research are bilingual: They speak Moksha and Russian natively, but use Moksha as their main language at home. A main body of data were collected in the course of fieldwork conducted in 2013-2019. Earlier trips (in 2013-2015) were part of the Lomonosov Moscow State University fieldwork and were supervised by S. Ju. Toldova. As I was unable to do fieldwork trips during the Covid-19 pandemic, some of the remaining questions were studied online, via Skype or WhatsApp.

The data were collected by means of elicitation: Moksha speakers were asked to translate a sentence from Russian to Moksha or evaluate a constructed Moksha sentence and correct it if necessary. For cases where native speakers' opinions are just minimally different, I provide averaged judgments, but if evaluations are radically different, this is explicitly mentioned in the text.

The grammaticality of examples is in this work notated as follows: '*' indicates

[1] http://www.unesco.org/languages-atlas/index.php

unacceptability of a sentence, '?' and '??' mark that a sentence is mildly and largely degraded correspondingly. 'OK' indicates a full grammaticality, but is used only if its absence can be misleading (for instance, if a grammatical and an ungrammatical parts of a sentence are compared). '%' shows that a sentence is ungrammatical for some speakers and acceptable for others. '#' marks sentences that are semantically or pragmatically unacceptable in a given context, but are fully grammatical otherwise.

Examples are presented in accordance with the Leipzig grossing rules. One exception is that symbol '=' is not used to separate clitics, because affixal or clitic status of some markers is not clear. Grammatical meanings that are present in a word, but are not overtly realized are indicated in square brackets, as a rule. This does not apply to the following meanings: indicative, active voice, indefiniteness for nouns, singular number for nouns of indefinite declension. They are not represented in glosses.

Moksha sentences are written in a practical transcription that was developed by the participants of the Lomonosov Moscow State University fieldwork project and is used in the recent Moksha grammar (see Toldova & Kholodilova (2018)). This transcription is mainly based on IPA but inherits some properties of a traditional Finno-Ugric transcription (see Collinder (1957: ix–xiii), Sinor (1988)). Table in (2) comes from (Kukhto 2018) and shows how the transcription used here corresponds to IPA.

(2) Practical transcription vs. IPA

IPA	Practical transcription	IPA	Practical transcription
m	m	ʃʲː(ʃt͡ʃ)	šč
n̪	n	ʒ	ž
n̪ʲ	n'	t̪s̪͡	c
p	p	t̪s̪͡ʲ	c'
b	b	t͡ʃ	č
t̪	t	ç	j̊
t̪ʲ	t'	j	j
d̪	d	ɾ̥	r̥
d̪ʲ	d'	ɾ̥ʲ	r̥'
k	k	ɬ̪	l̥
g	g	ɬ̪ʲ	l̥'
x	x	l̪	l
f (ɸ)	f	l̪ʲ	l'
v (β)	v	i	i
s̪	s	u	u
s̪ʲ	s'	e	e
z̪	z	ə	ə
z̪ʲ	z'	o	o
ʃ	š	ɛ	ɛ

In the remaining part of this section, I will sketch some characteristics of the Moksha grammar. I will start with the nominal morphology. Nouns in Moksha are marked for number, definiteness, possessivity, and case. Number category has two values: singular and plural. Definiteness also has two values: overt definite and often null indefinite marking. Moksha grammars call them indefinite and definite declensions, because definiteness determines the shape and availability of other markers. I will also use these terms. Possessive marking realizes person and number of a possessor. The case system in Moksha distinguishes 15 cases: nominative, genitive, dative, ablative, inessive, elative, illative, lative, prolative, translative, caritive, causalis, equative, temporalis, and vocative. Note that there is no case called 'accusative'. That is because a marking of a direct object is the same as a marking of a possessor and this case is called genitive. In addition to the rich case system, Moksha has postpositions.

Nominal morphology is not agglutinative (as in some other Finno-Ugric languages), i.e., multiple features are often expressed by one exponent and there are non-trivial restrictions on a combination of features. For instance, definiteness cannot be marked in the presence of possessive exponents: In the indefinite declension, number is marked only in the nominative. In the definite declension, only three case forms (nominative, genitive, and dative) are distinguished. Table (3) presents a part of the nominal paradigm.

(3) Part of the Moksha nominal paradigm illustrated by the noun vel'ə 'village'

	Indefinite declension		Definite declension	
	SG	PL	SG	PL
nominative	vel'ə	vel'ə-t	vel'ə-s'	vel'ə-t'n'ə
genitive	vel'ə-n'		vel'ə-t'	vel'ə-t'n'ə-n'
dative	vel'ə-n'd'i		vel'ə-t'i	vel'ə-t'n'ə-n'd'i
ablative	vel'ə-də			
inessive	vel'ə-sə			
elative	vel'ə-stə			

I will now turn to the verbal morphology. Moksha distinguishes 5 grammatical moods: indicative, imperative, optative, conditional, and conjunctive. Verbs in the indicative mood have one of the three tense-aspect forms: present, preterite, or imperfect. In the optative and conditional, only present and imperfect are marked, and other moods do not co-occur with tense-aspect markings. Verbs also bear aspectual exponents (avertive, inchoative, semilfactive, *i.a.*), but only frequentative approaches a status of the grammatical category. Moksha has a voice category with two values: active and passive. Finally, verbs take agreement morphology. They can agree with subjects as well as with both subjects and objects. Exponents of subject and subject-object agreement are different. In general, two numbers and three persons can be distinguished, but some oppositions are not always expressed. For instance, in the subject-object agreement forms, the number of the object is not realized if the subject is plural, and the number of the subject is not realized if the object is plural and first or second person.

The next topic is the marking of core arguments. Even though Moksha does not have a case called accusative, it belongs to accusative languages: Canonical subject of an intransitive (S-argument) as well as of a transitive clause (A-argument) receives nominative case (often not marked overtly), and a verb agrees with the subject in both cases. This is illustrated in (4).

(4) a. T'ɛ ava-s' ud-i.
this woman-DEF.SG[NOM] sleep-NPST.3[SG]
'This woman sleeps.'

b. T'ɛ ava-s' rama-z'ə kut-t'.
this woman-DEF.SG[NOM] buy-PST.3SG.O.3SG.S house-DEF.SG.GEN
'This woman bought the house.'

Moksha has differential object marking. A direct object (O-argument) can be either unmarked (see (5a)) or marked for genitive (see (5b)). The choice of a marking is determined by an interplay of factors that include definiteness, referentiality and information-structural status; see Toldova (2018). Greatly simplifying the pattern, definite nouns tend to be marked for genitive and indefinite nouns tend to have no overt case marking:

(5) a. Mon n'ɛj-ən' kn'iga.
I[NOM] see-PST.1SG book
I saw a book.

b. Mon n'ɛj-in'ə t'ɛ kn'iga-t'.
I[NOM] see-PST.3.O.1SG.S this book-DEF.SG.GEN
I saw this book.

The marking of the direct object correlates with verbal agreement. As a rule, verbs do not agree with unmarked objects and agreement with genitive objects is obligatory.

The last topic that I will discuss in this section is word order. Grammars (see, e.g., Zaicz (1998), Koljadënkov (1954)) suggest that the basic word order is SVO, but note that other word orders are possible as well. My data show that 6 possible word orders for a sentence with a subject, an object, and a verb are grammatical:

(6) a. Ava-s' rama-z'ə kut-t'. (SVO)
woman-DEF.SG[NOM] buy-PST.3SG.O.3SG.S house-DEF.SG.GEN

b. Ava-s' kut-t' rama-z'ə. (SOV)
woman-DEF.SG[NOM] house-DEF.SG.GEN buy-PST.3SG.O.3SG.S

c. Kut-t' ava-s' rama-z'ə. (OSV)
house-DEF.SG.GEN woman-DEF.SG[NOM] buy-PST.3SG.O.3SG.S

d. Kut-t' rama-z'ə ava-s'. (OVS)
house-DEF.SG.GEN buy-PST.3SG.O.3SG.S woman-DEF.SG[NOM]

e. Rama-z'ə ava-s' kut-t'. (VSO)
buy-PST.3SG.O.3SG.S woman-DEF.SG[NOM] house-DEF.SG.GEN

f. Rama-z'ə kut-t' ava-s'. (VOS)
buy-PST.3SG.O.3SG.S house-DEF.SG.GEN woman-DEF.SG[NOM]
'The woman bought the house.'

On the basis of a collection of texts recorded by participants of the Lomonosov Moscow State Univeristy fieldwork project, Toldova (2018) identifies some tendencies. First, in an intransitive clause, the SV order is more frequent for clauses where a pronoun or a noun with a definite or a possessive marking is a subject. VS is, on the contrary, more frequent if the subject is marked as indefinite. Second, in transitive clauses, the SOV order is somewhat more rare than the SVO order in general, but significantly more rare in clauses where a verb does not agree with a direct object. Third, there is a tendency for a subject to precede both an object and a verb in transitive clauses. Overall, however the topic of word order in Moksha remains heavily understudied.

A word order in the noun phrase is less free: There are modifiers that obligatorily precede the noun. These modifiers include demonstrative pronouns, numerals, and adjectives; see (7) with an adjective.

(7) Mon n'ɛj-in'ə [ravžə pin'ə-t'] / *[pin'ə-t' ravžə].
I see-PST.3.O.1SG.S black dog-DEF.SG.GEN dog-DEF.SG.GEN black
'I saw the black dog.'

Such restrictions are not attested with DP and PP modifiers of the noun:

(8) Kol'ɛ kepəd'-əz'ə [t'ɛ ava-t' sumka-nc]
Kolia grab-PST.3SG.O.3SG.S this woman-DEF.SG.GEN bag-3SG.POSS.SG.GEN
/ [sumka-nc t'ɛ ava-t'].
bag-3SG.POSS.SG.GEN this woman-DEF.SG.GEN
'Kolia grabbed this woman's bag.'

Finite nominal modifiers such as sentential arguments or relatives obligatorily follow nouns:

(9) Mon n'ɛj-sa pin'ə-t' [kona-n' ezdə
I see-NPST.3SG.O.1SG.S dog-DEF.SG.GEN which-GEN in.ABL
pel'-an].
fear-NPST.1SG
'I see the dog that I am afraid of. '

As for the relative position of nominal modifiers, all pairwise permutations are grammatical, but some preferences and tendencies are observed similarly to the word order in a clause; see Pleshak & Kholodilova (2018) for details.

1.2.2 Inverse case attraction

This second part of this background section presents an overview of ICA, its cross-linguistic distribution, and questions central to the research on this phenomenon.

A definition of the ICA that does not presuppose any specific analysis is as follows: ICA is a phenomenon under which a head of a finite relative clause that is to the left of a left-peripheral material in the relative CP (such as a relative pronoun or a complementizer) shows a case marking assigned to a relativized position inside the relative clause. ICA is schematically shown in (10). Note that the position of the head noun is not restricted for being inside or outside of the relative clause in this scheme. In what follows, the case assigned in the relative clause (case α in (10)) will be called an internal case and the case assigned according to the position of the head noun in the main clause (case β here) will be called an external case.

(10) [[head-α rel.pron-α ... case.assigner$_{[\text{case: }\alpha]}$ ...] ... case.assigner$_{[\text{case: }\beta]}$ ...]

Example in (11) illustrates ICA in Latin. Here, *ubrem* 'city.ACC' is the head of the relative clause. As it is the subject of the main clause, it is expected to show nominative case form. Instead, the head noun is marked for accusative that is assigned in the gap position inside the relative clause and that also appears on the relative pronoun.

(11) [**Urbem** quam statuo] vestra est.
city.ACC which.ACC I.found yours is
'The city that I found is yours.' (Bianchi (1999: 93, (48)))

Georgi & Salzmann (2017) suggest that the term case attraction can also apply to phenomena where an unusual case marking is not directly present as such but influences other processes in a sentence such as, for instance, a distribution of resumptive pronouns in Swiss German relative clauses that depends on both the case assigned to a head noun in the main clause and the case assigned in the relativized position.

A research on ICA started with by now extinct Indo-European languages. Among them, ICA is attested in ancient Greek (Grimm (2005: 78-92)), Hittite, Old Persian, Oscan, and Umbrian (Hahn (1964)), Latin (Touratier (1980: 147-211)), Vedic and Sanskrit (Gonda (1975: 195)), Middle High German (Pittner (1995)), Modern Church Slavonic (Smotrickij (1619: 238)), Old English (Harbert (1983)). At some points it was believed that ICA is restricted to extinct Indo-European languages (see, e.g., De Vries (2003)) but further research has shown that ICA is also present in currently existing Indo-European languages; see Albanian of Xranje (Bevington (1979)), Dari (Houston (1974)), East Franconian German (Fleischer (2006: 229)), Modern Persian (Aghaei (2006: 72–76, 90–95)), and non-standard Icelandic (Wood, Sigurðsson, & Nowenstein (2017)). The phenomenon was further attested in a number of Non-Indo-European languages; see Besermyan Udmurt (Belyaev (2012), Kholodilova & Privizentseva (2015)), Ingrian Finnish (Kholodilova (2013)), Nez Perce (Deal (2016)), and Koryak (Abramovitz (2021)), among others. Recent in-depth research on ICA is primarily based on languages from the last group.

All in all, currently available data do not allow to conclude that the distribution of the ICA is genetically or areally restricted. Nevertheless, despite the growing number of languages that have ICA, the phenomenon remains rather rare. There are several hypotheses trying to explain why it is the case. One of them suggests that ICA is a step in a diachronic development of relative clauses. It arises when a language with correlative clauses develops externally-headed relativization strategy (see Haudry (1973), Bianchi (1999, 2000b)) or in a reverse scenario when a language with externally-headed relatives develops correlatives (see Harris (1992)). Another hypothesis was proposed by Kholodilova & Privizentseva (2015). It suggests that ICA tends to be present only in non-standard language varieties and disappears in the course of standardization. For now, both hypotheses seem to have some but by far insufficient empirical basis and I will not delve into this topic.

A different question most recently raised by Abramovitz (2021) is whether ICA is uniform cross-linguistically; that is, whether such relatives share some relevant set of properties in different languages. One point of cross-linguistic variation is identified by Kholodilova & Privizentseva (2015). They observe that while in some languages ICA is possible independently of the type of the head noun, in others (e.g., in Standard Udmurt) it is allowed only in light-headed relative clauses; that is, only in relatives with a pronoun but not a noun in the head. Abramovitz (2021), on the other hand, shows that the phenomenon appears to be uniform across a number of languages with respect to extrapostion and extraction out of the relative CP.

Besides ICA, there is also a progressive case attraction sometimes called relative attraction. In this case, it is a relative pronoun that shows case assigned to the position of the head noun in the main clause instead of an expected case assigned in the relative clause. This phenomenon is schematically shown in (12).

(12) [[head-β rel.pron-β ... case.assigner$_{[\text{case: }\alpha]}$ ...] ... case.assigner$_{[\text{case: }\beta]}$ ...]

Progressive case attraction is attested in Latin (Bianchi (1999)), New Testament Greek (Kirk (2012: 202)), Old High German (Pittner (1995: 198)), and Nez Perce (Deal (2016)) among others. Example (13) illustrates progressive attraction on the basis of Nez Perce. In this example, the relative pronoun *yoxˆ* displays a nominative case form instead of an expected accusative case. Nominative here corresponds to the position of the head noun in the main clause.

(13) NOM → ACC
Mine hii-we-s samxˆ yoxˆ kex ‘a-sayqi-ca?
where AGR-be-TAM shirt.NOM which.NOM C AGR-like-TAM
‘Where is the shirt that I like?’ (Deal 2016: 441)

Both attraction phenomena can co-exist in a language (see, e.g., Latin or Nez Perce), but this is by far not always the case. Moksha, for instance, has inverse, but not progressive attraction. Despite similarities between inverse and progressive attraction and an initial appeal of an idea to analyze them in the same vein, existing approaches usually focus only on one of the phenomena, so that proposed analyses are not meant to and often cannot account for the other one.

A separate niche in the research on case attraction is taken by experimental studies on languages where native speakers generally judge attraction as ungrammatical, but experiments show that effects of case attraction occur in processing of relative clauses (see Bader & Meng (1999), Bader & Bayer (2006), and Czypionka, Dörre, & Bayer (2018)). Properties of such case attraction seem to be different in that it is, for instance, sensitive to markedness of interacting cases.

Theoretical research on ICA focuses on solving two largely related issues: what is the structure of relatives with ICA and what underlies an unusual case marking on the head noun. The first question deals with placing relative clauses with ICA in the typology of relative clauses. The options are as follows: First, relative clauses with ICA have the same structure as correlatives, that is, the head is inside the relative clause and the relative clause is a CP at the left periphery of the sentence (see Bhatt (2005), Georgi & Salzmann (2017)). Second, relative clauses with ICA belong to internally-headed relatives. This means that the head is inside the relative clause as in the previous option, but the relative clause is embedded under a possibly null nominal shell (see, e.g., Abramovitz (2021)). Third, ICA belongs to externally-headed relatives (see Deal (2016)).

A second question deals directly with an unusual case marking on the head noun. An answer to this question correlates with an answer to the previous question.

Nevertheless, two options can be identified. First, the head of the relative clause shows case assigned in the gap position in the relative CP, because it occupies this position at some stage of the derivation (see Bianchi (1999, 2000b), Cinque (2015, 2020), Deal (2016), Wood et al. (2017), Abramovitz (2021)). Second, the head receives internal case via agreement with a relative pronoun or an operator that is on the left periphery of the relative CP (see Harbert (1983), Gračanin-Yuksek (2013), and also Czypionka et al. (2018)).

1.3 Outline

This work is structured as follows.

In chapter 2, I investigate the syntactic structure of relative clauses with ICA. I argue that heads of these relative clauses must be outside of the relative CP. I further show that the obligatory left-peripheral position of relative clauses with ICA results from movement, not base generation on the left.

In chapter 3, I apply connectivity diagnostics to relative clauses in Moksha and show that relatives with ICA are derived by raising. I further argue that raising in Moksha (and potentially in other languages) must co-exist with the head-external derivation.

In chapter 4, I study syntax of raising and propose a formal analysis of relatives with ICA in Moksha. First, I suggest that the raising derivation of relative clauses involves projecting movement of the head and that it follows from projection by selection labeling algorithm combined with the possibility of upward search. Second, I show that in different languages the raising derivation can result in the external or the internal case marking on the head. I derive different case markings from different orderings of the case probe. Third, I argue that left-peripheral position of the relative clause illustrates the so-called forced ex-situ effect and propose that forced ex-situ effects are best derived by second order selection features. I also show how other properties of relative clauses with ICA follow under my analysis.

In chapter 5, I investigate the consequences of the proposal. I talk about delayed checking of selection features and late merge, show that forced ex-situ effects are wide-spread cross-linguistically and discuss labeling more generally.

Chapter 2

Inverse case attraction

2.1 Introduction

Relative clauses with ICA in Moksha Mordvin are at the empirical center of this dissertation. Such relative clauses are exemplified in (1). They are characterized by the position of a head noun to the left of a relative pronoun, but differ from regular externally-headed relative clauses in a case marking of the head noun. In relatives with ICA, it shows a case assigned to the relativized position inside the relative clause instead of a case assigned according to its position in the main clause.

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

The goal of this chapter is to investigate the syntactic structure of relative clauses with ICA, compare them to cross-linguistically established types of relative clauses, and determine the place of such relatives in the typology of relative clauses. In what follows, I will show that relative clauses with ICA share their properties with externally-headed relatives that are derived by the raising analysis, and argue that despite the internal case marking the head of such relative clauses is best viewed as being in the main clause, outside of the relative CP.

The chapter proceeds as follows. In section 2.2, I will start with a necessary background on relative clause typology, relativization strategies in Moksha, and existing approaches to the syntax of relatives with ICA. After this, I will go through main properties of relative clauses with ICA in Moksha in section 2.3. I will talk about their interpretation, positional restrictions, extraposition, coordination, and a possibility of extraction out of such relatives. In section 2.4, I will summarize the data and propose that relatives with ICA are best analyzed as externally-headed relative clauses on their basis. After this, I will talk about different positions of a head noun in externally-headed relatives and argue that the whole head noun phrase is

outside of the relative CP. In the final section 2.5, I will discuss further properties of relatives with ICA that have not immediate effect for the structure assigned to them: restrictions on possible combinations of an external and an internal case.

2.2 Background

2.2.1 Typology of relative clauses: Position of the head noun

The goal of this section is to introduce types of relative clauses determined by the position of the head noun, but two terminological remarks are due before that.

First, the term *relative clause* is often used ambiguously in that it can indicate either a relative CP or a bigger constituent that also includes a head noun. I will continue using this term without resolving this ambiguity, but will talk explicitly about a relative CP or about the whole relative construction where necessary.

Second, the term *head noun* is potentially misleading: It indicates a relativized nominal constituent that does not have to be a syntactic terminal, but is called a head noun as it 'heads' a relative clause. Furthermore, a head noun does not have to contain a noun, but can be, for instance, pronominal in some cases.

Turning now to the typology of relative clauses, the position of the head noun is one of the basic characteristics of a relative clause. Two types of relative clauses are traditionally identified on this basis: externally- and internally-headed (see Lehmann (1984, 1986), De Vries (2002: 17-20)). Externally-headed relative clauses are characterized by the position of the head noun outside of the relative CP. The relative CP can then precede or follow the head noun. The head of internally-headed relatives is, on the contrary, inside the relative CP. As shown by Hiraiwa (2005, 2017), the internal head does not have to remain in situ, it can move to a position on the periphery of a relative clause, which makes it more complicated to distinguish between relative clauses with an external and an internal head.

Correlatives constitute a separate group among internally-headed relative clauses. They are characterized by a position of the relative clause on the left periphery of a sentence, absence of a nominal shell above the relative CP, an obligatory presence of a correlative pronoun in the main clause, and a maximalizing interpretation (see Srivastav (1991), Dayal (1996), Lipták (2009), Lin (2020)).

A complication to this simple distinction between externally- and internally-headed relative clauses comes from the notion of movement as it allows a head of a relative clause to be in different positions throughout a derivation. For instance, a head can start its derivational path inside a relative clause, but then it moves to a position outside of the relative CP thereby rendering a relative clause internally-headed at earlier stages of the derivation, but externally-headed in the resulting structure. In what follows, classifying a relative clause as internally- or externally-headed, I will refer to the surface position of the head noun inside or outside the

relative clause, not its derivational path.

Another complication lies in that the material of the head noun can be split between the relative and the main clause. Such an analysis is, for instance, suggested in some versions of the raising derivation (see Kayne (1994), Bianchi (1999, 2000b)) for relative clauses that are considered externally-headed from the standard typological point of view. In particular, it was suggested that higher nominal projections such as determiners and quantifiers are outside of the relative CP, while nouns themselves are inside the relative CP, e.g., in the specifier of the C head. Such an analysis, however, does not allow the head of the relative clause to have the same structure as regular noun phrases: The noun cannot be the complement of the D head; it is the specifier of D's complement. For the time being, I will abstract away from this specific implementation of the structure for externally-headed relative clauses, but I will return to this question in section 2.4, where I will argue that such structures should be dismissed in general, because they provide an incorrect constituency for the noun phrase.

2.2.2 Relativization strategies in Moksha

With this typological background at hand, I will now turn to the strategies of relativization in Moksha.

Besides relatives with ICA, Moksha has relative clauses of two types: correlatives and externally-headed relative clauses. Let's start with correlatives. Cross-linguistically, this type of relative clauses is characterized by the position of the relative CP on the left periphery and the presence of a correlative pronoun in the main clause (see Srivastav (1991), Dayal (1996), Lipták (2009)). In Moksha, a head noun of correlatives is inside the relative CP.

Example (2) illustrates a correlative construction in Moksha.

(2) [Kona jalga-z'ə-n'd'i t'aš-n'ə-n'] mon
which friend-1SG.POSS.SG-DAT write-FREQ-PST.1SG I[NOM]
n'ɛj-sa son' kurək.
see-NPST.3SG.O.1SG.S PRON.3SG.GEN soon
'I will soon see my friend to whom I have been writing.
(Lit.: To which friend I have been writing, I will see him soon.)'

In (2), the third person pronoun *son'* in the main clause is a correlative pronoun. It occupies the position that corresponds to the relative clause. The correlative clause *kona jalgaz'ən'd'i t'ašn'ən'* 'to which friend I have been writing (lit.)' is on the left periphery of the sentence. It contains the relative pronoun *kona* 'which'. The relative pronoun is not marked for case, number, or definiteness. It is followed by the head noun *jalgaz'ən'd'i* 'to my friend' that bears case assigned inside the relative clause. Both the relative pronoun and the head noun are at the left periphery of the relative CP. The structure of correlatives is schematically represented in (3).

(3) [$_{CP}$ rel.pron head-α ...] [$_{MC}$ ... pronoun-β ...]

The other type of relative clauses in Moksha is the regular externally-headed relative construction. It is illustrated in (4).

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

Here, the relative clause *konan'd'i t'ašn'ən'* 'to whom I have been writing' immediately follows the head noun *jalgaz'ən'* 'my friend'. The head noun and the relative clause seem to build a constituent that is embedded into the main clause. The relative clause contains the relative pronoun *kona*, same as in correlatives. It is placed on the left periphery of the relative CP. Both the head noun and the relative pronoun are inflected and show different case markings. The head noun has genitive case assigned in accordance with the direct object position of the head noun in the main clause. The relative pronoun is marked for the dative assigned inside the relative CP. I will refer to the position inside the relative clause where the relative pronoun gets case and that essentially corresponds to the head noun as the relativized or the gap position. The structure of externally-headed relatives in Moksha is represented in (5).

(5) [$_{MC}$ ... head-β [$_{CP}$ rel.pron-α ...] ...]

In addition to correlatives and externally-headed relative clauses, Moksha has relative clauses with ICA. They are illustrated in (6) (repeated from above).

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

Relative clauses with ICA are similar to externally-headed relative clauses in that the relative CP *konan'd'i t'ašn'ən'* 'to whom I have been writing' linearly follows the head noun *jalgaz'ən'd'i* 'to my friend' and both the head noun and the relative pronoun *konan'd'i* are inflected. Relative clauses with ICA however differ from externally-headed relatives and pattern with correlatives in that the head noun is marked for a case assigned inside the relative clause and the constituent that contains the head noun and the relative CP is on the left periphery of the sentence. Unlike correlatives, relative clauses with ICA do not require a correlative pronoun in the main clause. It is thus not yet clear what is the exact structure of relatives with ICA. For now they can be schematically represented as in (7), which does not include several relevant details.

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

2.2.3 Inverse case attraction: State of the art

The description of relative clauses with ICA in Moksha provided in the end of the last section emphasizes that these relatives have properties of both relative clauses with external head and correlatives, at least at the first sight. This is therefore not immediately clear what type of relative clauses they belong to and whether the head noun is inside or outside of the relative CP. In this section, I will present existing approaches to the structure of relative clauses with ICA developed on the basis of the data from other languages.

According to the first view, relative clauses with ICA are a sub-type of correlative clauses that differs from the standard correlatives by a linearly reversed order of the relative pronoun and the head noun (see Pittner (1995), Bhatt (2005), Georgi & Salzmann (2017), and also Bianchi (1999, 2000b)). Relative clauses with ICA are thus assigned the structure in (8). The proponents of this analysis usually rely on limited data of extinct Indo-European languages that do not allow to examine further properties, so that the main arguments for this account are the internal case on the head noun and the left-peripheral position of the relative clause.

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

The second approach groups relative clauses with ICA with internally-headed relative clauses but not with correlatives (see Abramovitz (2021)). It differs from the previous approach in that the relative CP is embedded in the nominal structure. This nominal structure includes higher D-level nominal projections as well as a null noun. The overtly realized noun is inside the relative CP, but it moves to the left, into one of the extended CP projections. Main arguments for this position are a ban on extraposition of the relative CP and a possibility for a CP-internal material to move to left of the head noun. Under this approach, relatives with ICA are assigned structure (9).

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

According to the third approach, relative clauses with ICA are externally-headed relative clauses (see Deal (2016)). Arguments in favor of this analysis come from the comparison between relatives with ICA and regular externally-headed relatives that reveals similarities in stacking, coordination, and the position of nominal modifiers to the left of the head noun, among others. The structure is given in (10).

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

To sum up, existing analyses of relative clauses with ICA differ in whether the head noun is inside or outside of the relative CP. Approaches that postulate the position

of the head noun inside the relative CP further differ in whether there are nominal projections above the relative CP. In result, virtually all major structures of relative clauses were suggested for relative clauses with ICA by different researchers: ICA was argued to represent (i) correlatives, (ii) regular internally-headed relatives, or (iii) regular externally-headed relatives. In the next section, I will investigate properties of relative clauses with ICA in Moksha that allow to determine their place in the typology of relatives. I will then argue that relative clauses with ICA are externally headed.

2.3 Properties of relative clauses with inverse case attraction

I will start by exploring semantic interpretation of relative clauses in Moksha and syntactic restrictions related to them in section 2.3.1. I will show that relative clauses with ICA pattern with regular externally-headed relatives and differ from corrlatives with respect to their interpretational possibilities. I will then turn to the left periphery restriction in 2.3.2. This property distinguishes between relatives with ICA and regular externally-headed relatives, but as I will argue it also does not bring relatives with ICA and correlatives closer together, because the nature of this requirement is different for them. I will then continue with positional restrictions discussing extraposition and coordination in 2.3.3. Finally, I will talk about extraction out of the relative clause in 2.3.4 and show that together with extraposition it separates relatives with case attraction from externally-headed relatives in Moksha, but not from externally-headed relatives cross-linguistically.

2.3.1 Interpretation

Since Grosu & Landman (1998) and Grosu (2002), three interpretations of relative clauses are standardly identified: appositive, restrictive, and maximalizing. Interpretations differ in whether the meaning of a noun phrase with a relative clause is determined inside or outside of the relative CP. Under the appositive interpretation, the reference of the noun phrase is fully determined outside of the relative CP and the relative clause further characterizes a selected referent. Under the restrictive interpretation, the meaning of the noun phrase is determined jointly by a material in the relative CP and a material in the main clause. Under the maximalizing interpretation, the meaning is fully determined inside the relative CP.[2]

[2]More formal characteristics of the three semantic types are provided, for instance, in Grosu (2002): Appositive relative clauses are relative clauses that denote a proposition that contains a free variable. This free variable receives its value from the main clause. Restrictive relative clauses denote a property. A variable that they contain must be abstracted over. Maximalizing relative clauses are interpreted as the singleton set whose member is the output of uniqueness operator.

Which interpretation a relative clause has can be determined by a set of possible continuations. Let's consider the example in (11) and the two continuations in (12).

(11) Two criminals, who Peter caught, were running away from the police.

(12) a. A third criminal was also running away but he managed to escape.
*appositive; OKrestrictive; OKmaximalizing

b. Peter also caught a third criminal but he was hiding in a barn.
OKappositive; OKrestrictive; *maximalizing

Grammatical judgments in (12a-b) do not reflect the interpretations of the sentence (11) in English, but indicate the availability of a continuation if a relative clause with a lexical content as in (11) were to have a given interpretation. For instance, the continuation in (12a) indicates that other criminals are also running away. It is compatible with the restrictive or maximalizing interpretation of the relative clause, but is infelicitous under the appositive interpretation, because the meaning of the construction must then be fully determined in the matrix clause that postulates that exactly *two* criminals were running away. Continuation in (12b), on the other hand, indicates that Peter caught more criminals. It is felicitous under the appositive or restrictive interpretation, but infelicitous under the maximalizing reading.

Thus, the two continuations in (12a-b) allow to distinguish between the three interpretations of relative clauses: The appositive interpretation renders the first, but not the second continuation infelicitous. Both continuations are compatible with the restrictive interpretation. The maximalizing interpretation excludes the second continuation, but is compatible with the first one. A semantic interpretation also determines further properties of relative clauses. For instance, only appositive relative clauses can include parentheticals emphasizing that a relative clause contains background information. Restrictive relative clauses allow for indefinite non-specific heads. Maximalizing relative clauses do not allow for stacking, unlike other types of relative clauses.

Against this background, I will turn to interpretation possibilities of relative clauses in Moksha. I will start with relative clauses with ICA, then turn to regular externally-headed relative clauses and to correlatives. I will show that relative clauses with ICA as well as regular externally-headed relative clauses can be appositive or restrictive, while correlatives are maximalizing in Moksha.

The appositive interpretation of relatives with ICA is illustrated in (13).

(13) NOM ← GEN
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[NOM] run.away-AVR-PST.3-PL
'Exactly two criminals, who Petja, by the way, caught, were running away.'

According to native speakers' judgments, continuation (14a) is infelicitous, while continuation (14b) is possible. Incompatibility of (14a) indicates that the head noun is interpreted in the matrix clause and the reference of the noun phrase that contains a relative clause is fully determined there; that is, the relative clause is appositive. The appositive interpretation (as opposed to the restrictive one) is in this example ensured by the parenthetical expression *meždu pročim* 'by the way'. It emphasizes that the information in the relative CP is not essential.

(14) a. #Kolmə-c'ə pr'istupn'ik-s' vor'gəd'-kšn'ə-s' no
three-ORD criminal-DEF.SG[NOM] run.away-AVR-PST.3[SG] no
Pet'ɛ iz'-əz'ə kunda son'.
Petja[NOM] NEG.PST-PST.3SG.O.3SG.S catch PRON.3SG.GEN
'Petja did not catch the third criminal that was also running away.'

b. OKPet'ɛ kunda-z'ə kolmə-c'ə pr'istupn'ik-t'
Petja[NOM] catch-PST.3SG.O.3SG.S three-ORD criminal-DEF.SG.GEN
no son kɛš-s' saraj-sə.
but PRON.3SG hide-PST.3[SG] barn-IN
'Peter also caught a third criminal, but he was hiding in a barn.'

The availability of the restrictive interpretation for relative clauses with ICA is illustrated in (15)-(16). Note that *kona* that precedes the head noun in (15) is part of the indefinite pronoun *koj kona* 'some' that modifies the head noun: As it is often the case cross-linguistically (see Haspelmath (1997: 26-27)), indefinite pronouns in Moksha are based on interrogative pronouns. Relative pronoun *kona* 'which' in (15) follows the head noun and is thus in its usual position.

(15) NOM ← GEN
Koj kona pr'istupn'ik-n'ə-**n'** kona-t'n'ə-n'
INDEF which criminal-DEF.PL-GEN which-DEF.PL-GEN
kunda-z'ən' Pet'ɛ vor'gəd'-kšn'ə-s'-t'.
catch-PST.3PL.O.3SG.S Petja[NOM] run.away-AVR-PST.3-PL
'Some criminals that Petja caught were running away.'

Under the restrictive interpretation, example (15) denotes a non-empty intersection of a set of criminals arrested by Petja and a set of individuals that were running away. This implies that there can be two further sets of criminals: those who were arrested by Petja, but not running away, and those who were running away, but not arrested. The existence of the first set is incompatible with the maximalizing interpretation of the relative clause, while the existence of the second set is incompatible with the appositive interpretation. The existence of both these sets is ensured by the continuation in (16) that is judged as felicitous by native speakers and thus shows that the relative clause in (15) can be interpreted restrictively.

(16) OKKolmə pr'istupn'ik-n'ə-n' Pet'ɛ iz'-əz'ən' kunda
three criminal-DEF.PL-GEN Petja[NOM] NEG.PST.3PL.O.3SG.S catch.CN

i kaft-t'n'ə maks'-s'-t' pr'ɛ sin'-c'.
and two-DEF.PL[NOM] give-PST.3-PL head they-INT
'Petja did not catch three criminals and two criminals surrendered themselves.'

The availability of the restrictive interpretation for relative clauses with ICA is further confirmed by (17). In this example, the indefinite non-specific noun phrase with the free choice quantifier is the head of the relative clause. This renders the appositive and the maximalizing interpretation impossible, because a specific head noun is required for both of them.

(17) NOM ← GEN
L'ubovaj pr'istupn'ik-**t'** kona-n' pal'icija kunda-z'ə
any criminal-DEF.SG-GEN which police[NOM] catch-PST.3SG.O.3SG.S
jora-j vor'gəd'-əm-s.
want-NPST.3[SG] run.away-INF-ILL
'Any criminal who police caught wants to escape.'

As for the maximalizing interpretation, it is not attested for relative clauses with ICA, at least, in a regular case. This, however, does not exclude that there might be special sub-types of relative clauses with ICA that allow for the maximalizing interpretation, similarly to in English, where externally-headed relative clauses are typically not maximalizing, but there is sub-type of so-called degree relatives which are externally-headed and maximalizing (see Carlson (1977), Grosu & Landman (1998)). Whether there are such special sub-types of relative clauses with ICA (as well as for regular externally-headed relatives) in Moksha remains a topic for future research.

I will now turn to the interpretation of regular externally-headed relatives in Moksha. They show the same semantic profile as relative clauses with ICA: They are appositive or restrictive.

The appositive interpretation of a regular externally-headed relative clause is illustrated in (18). This example is parallel to the one in (13) with the only exception that the head of the relative clause shows the case assigned in the main clause. The continuation (19a) is infelicitous, while (19b) is allowed. This shows that the relative clause is indeed appositive.

(18) Rovnaj kaftə pr'istupn'ik-n'ə [kona-t'n'ə-n' meždu pročim
straight two criminal-DEF.PL[NOM] which-DEF.PL-GEN between others
kunda-z'ən' Pet'ɛ] vor'gəd'-kšn'ə-s'-t'.
catch-PST.3PL.O.3SG.S Petja[NOM] run.away-AVR-PST.3-PL
'Exactly two criminals, who Petja, by the way, caught, were running away.'

(19) a. #Kolmə-c'ə pr'istupn'ik-s' vor'gəd'-kšn'ə-s' no
three-ORD criminal-DEF.SG[NOM] run.away-AVR-PST.3[SG] no
Pet'ɛ iz'-əz'ə kunda son'.
Petja[NOM] NEG.PST-PST.3SG.O.3SG.S catch.CN PRON.3SG.GEN

'Petja did not catch the third criminal that was also running away.'

b. OKPet'ɛ kunda-z'ə kolmə-c'ə pr'istupn'ik-t'
Petja[NOM] catch-PST.3SG.O.3SG.S three-ORD criminal-DEF.SG.GEN
no son kɛš-s' saraj-sə.
but PRON.3SG[NOM] hide-PST.3[SG] barn-IN
'Peter also caught a third criminal, but he was hiding in a barn.'

The restrictive interpretation of regular externally-headed relatives is demonstrated by (20) and its felicitous continuation in (21). These data differ from the earlier ones on relatives with ICA only in the case of the head noun.

(20) Koj kona pr'istupn'ik-n'ə [kona-t'n'ə-n'
INDEF which criminal-DEF.PL[NOM] which-DEF.PL-GEN
kunda-z'ən' Pet'ɛ] vor'gəd'-kšn'ə-s'-t'.
catch-PST.3PL.O.3SG.S Petja[NOM] run.away-AVR-PST.3-PL
'Some criminals that Petja caught were running away.'

(21) OKKolmə pr'istupn'ik-n'ə-n' Pet'ɛ iz'-əz'ən' kunda
three criminal-DEF.PL-GEN Petja[NOM] NEG.PST.3PL.O.3SG.S catch.CN
i kaft-t'n'ə maks'-s'-t' pr'ɛ sin'-c'.
and two-DEF.PL[NOM] give-PST.3-PL head they-INT
'Petja did not catch three criminals and two criminals surrendered themselves.'

Regular externally-headed relative clauses also allow for an indefinite non-specific head noun (see (22)), which confirms the availability of the restrictive interpretation.

(22) L'ubovaj pr'istupn'ik-s' [kona-n' pal'icija
any criminal-DEF.SG[NOM] which police[NOM]
kunda-z'ə] jora-j vor'gəd'-əm-s.
catch-PST.3SG.O.3SG.S want-NPST.3[SG] run.away-INF-ILL
'Any criminal who police caught wants to escape.'

A semantic profile of correlative clauses in Moksha differs from both relative clauses with ICA and regular externally-headed relative clauses. In line with correlative clauses cross-linguistically (see Grosu (2002), Lipták (2009), Brasoveanu (2012), Lin (2020)), correlatives in Moksha allow only for the maximalizing interpretation. The maximalizing semantics of the correlative in (23) is shown by its incompatibility with continuation (24b).

(23) [Kona kaftə pr'istupn'ik-n'ə-n' Pet'ɛ kunda-z'ən'] s'in'
which two criminal-DEF.PL-GEN Petja catch-PST.3PL.O.3SG.S they[NOM]
vor'gəd'-kšn'ə-s'-t'.
run.away-AVR-PST.3-PL
'Petja caught the two criminals that were running away.'

(24) a. OKKolmə-c'ə pr'istupn'ik-s' vor'gəd'-kšn'ə-s' no
three-ORD criminal-DEF.SG[NOM] run.away-AVR-PST.3[SG] no

Pet'ɛ iz'-əz'ə kunda son'.
Petja[NOM] NEG.PST-PST.3SG.O.3SG.S catch.CN PRON.3SG.GEN
'Petja did not catch the third criminal that was also running away.'

b. #Pet'ɛ kunda-z'ə kolmə-c'ə pr'istupn'ik-t'
Petja[NOM] catch-PST.3SG.O.3SG.S three-ORD criminal-DEF.SG.GEN
no son kɛš-s' saraj-sə.
but PRON.3SG[NOM] hide-PST.3[SG] barn-IN
'Peter also caught a third criminal, but he was hiding in a barn.'

Another diagnostic that was argued to indicate the maximalizing interpretation is the ungrammaticality of stacking. According to Grosu & Landman (1998) and Grosu (2002), maximalizing relative clauses are interpreted as a singleton set whose unique member meets the content of the relative clause. Stacking of maximalizing clauses then leads to one of the two scenarios: First, singletons of stacked relative clauses contain different unique members and no individual can be denoted by a construction. Second, singletons contain an identical member and the construction is tautological. Grosu (2002) proposes that both scenarios must result in ungrammaticality of stacking. Another approach to the absence of stacking is developed by Bhatt & Pancheva (2006). Building on the analysis of correlative clauses as generalized quantifiers that apply to the main clause and bind a variable there (see Srivastav (1991), Dayal (1996)), they suggest that stacking is excluded, because each of stacked correlative clauses attempts to bind a correlative pronoun in the main clause, but the pronoun naturally cannot be bound more than once.[3]

Stacking is ungrammatical for correlatives in Moksha; see (25).

(25) *[Kona pɛr'ɛkɛ-t' pid'-əz'ə
which pie-DEF.SG.GEN cook-PST.3SG.O.3SG.S
sas'əda-z'ə] [kona (pɛr'ɛkɛ-t') min'
neighbor-1SG.POSS.SG[NOM] which pie-DEF.SG.GEN we[NOM]
srazu seva-s'k] son ul'-s' kapsta-n'.
immediately eat-PST.3.O.1PL.S PRON.3SG[NOM] be-PST.3[SG] cabbage-GEN
'The pie that my neighbor cooked that we immediately ate was with cabbage.'

Relative clauses with ICA as well as regular externally-headed relatives in Moksha can freely stack. This corroborates that these types of relatives are not maximalizing. Example (26) illustrates stacking of two relative clauses with ICA.

(26) NOM ← GEN
Pɛr'ɛkɛ-**t'** **kona-n'** pid'-əz'ə
pie-DEF.SG.GEN which-GEN cook-PST.3SG.O.3SG.S
sas'ədə-z′ə **kona-n'** min' srazu
neighbor-1SG.POSS.SG[NOM] which-GEN we[NOM] immediately
seva-s'k ul'-s' kapsta-n'.
eat-PST.3.O.1PL.S be-PST.3[SG] cabbage-GEN

[3] Davison (2009) (citing Hettrich (1988)) shows that correlative clauses in Sanskrit can stack and proposes that the stacking is excluded in some languages because of a language-specific condition that requires for a correlative clause to c-command a correlative pronoun in the main clause.

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

Example (27) shows stacking of two regular externally-headed relatives.

(27) Pɛrɛkɛ-s' [kona-n' pid'-əz'ə
pie-DEF.SG[NOM] which-GEN cook-PST.3SG.O.3SG.S
sas'ədə-z'ə] [kona-n' min' srazu
neighbor-1SG.POSS.SG[NOM] which-GEN we[NOM] immediately
seva-s'k] ul'-s' kapsta-n'
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.'

Unlike relative clauses with ICA and regular externally-headed relative clauses, correlatives do not allow for indefinite non-specific noun phrases in the head; see (28). This further confirms the lack of the restrictive interpretation.

(28) *[Kona l'ubovaj pr'istupn'ik-t' pal'icija kunda-z'ə]
which any criminal-DEF.SG[NOM] police catch-PST.3SG.O.3SG.S
son jora-j vor'gəd'-əm-s.
PRON.3SG[NOM] want-NPST.3[SG] run.away-INF-ILL
'Any criminal who police caught wants to escape.'

Another restriction attested for the correlative clauses in Moksha is the ungrammaticality of proper names in the head. This restriction is illustrated in (29).

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

In this example, the surname of the famous Russian writer is used as the internal head of the correlative clause and it results in ungrammaticality of the sentence. Native speakers comment that the sentence entails that there are multiple Pushkins, which contradicts their knowledge about real world. While such a restriction on proper names in the head noun position is not mentioned in a classical work on correlatives or maximalizing relatives in general, this seems to be related to the maximalizing interpretation. I tentatively suggest that this follows from the maximalizing (or definiteness) operator that applies to the relative clause, but turns out to be vacuous if the head noun already ensures that there is a unique individual denoted by the relative clause.

Relative clauses with ICA as well as regular externally-headed relative clauses in Moksha allow for proper names as head nouns and have an appositive interpretation then. Example (30) shows this for a relative clause with ICA.

(30) NOM ← GEN

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

Example (31) demonstrates the proper name in the head of the regular externally-headed relative clause.

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

Table (32) summarizes the data: Both relative clauses with ICA and regular externally-headed relative clauses can be appositive or restrictive. They show no differences with respect to diagnostics related to the interpretation. Correlatives, on the contrary, have the maximalizing interpretation and differ from other types of relatives in Moksha in which heads are possible as well as in the availability of stacking.

(32) Relative clauses and their interpretations in Moksha

	ICA	Regular externally-headed	Correlatives
Interpretation	APP, RESTR	APP, RESTR	MAX
Free choice quantifiers	OK	OK	*
Stacking	OK	OK	*
Proper names	OK	OK	*

Thus, the comparison between different types of relative clauses in Moksha reveals that (at least with respect to the properties discussed so far) relative clauses with ICA unambiguously pattern together with regular externally-headed relative clauses. I would like to suggest that these data not only show that relatives with ICA are not correlatives in Moksha, but also provide an evidence for relative clauses with ICA being externally-headed. The argument relies on a cross-linguistic picture, according to which there are correlations between a syntactic structure of a relative clause and a set of semantic interpretation it can have. One of the most well-known correlations of this type is that correlatives can be only maximalizing. Furthermore, internally-headed relative clauses were also shown to have restrictions on their semantic interpretation: They can be maximalizing or restrictive (see Grosu (2002, 2012), Watanabe (2004) and a recent research by Hanink (2021) and Hucklebridge

(2022)), but not appositive (see Lehmann (1984: 278), De Vries (2002: 29), Grosu (2012)). The nature of this restriction is essentially clear: The head of the relative clause is merged inside of a relative clause, remains there, and is not part of a main clause at any step of the derivation. The head noun is thus also expected to be interpreted in the relative clause, not in the main clause as would be required for the appositive interpretation.[4] The availability of the appositive interpretation for relative clauses with ICA illustrated in this subsection therefore provides an argument against analyzing them as internally-headed, but shows that the head is external despite the unusual case marking.

2.3.2 Left periphery restriction

Basics

In this section, I will talk about positional properties of relative clauses with ICA. These relative clauses must be on the left periphery as in (33).

(33) GEN ← DAT
[**Škaf-t'i** kona-n'd'i mon put-in'ə
closet-DEF.SG.DAT which-DAT I[NOM] put-PST.3.O.1SG.S
fətəgrafijə-t'n'ə-n'] min' jorda-s'k.
photo-DEF.PL-GEN we[NOM] throw.away-PST.3.O.1PL.S
'We threw away the closet in which I put the photos.'

Relative clauses with case attraction cannot follow the predicate of the main clause as shown (34).

(34) GEN ← DAT
*Min' jorda-s'k [**škaf-t'i** kona-n'd'i
we[NOM] throw.away-PST.3.O.1PL.S closet-DEF.SG.DAT which-DAT
mon put-in'ə fətəgrafijə-t'n'ə-n'].
I[NOM] put-PST.3.O.1SG.S photo-DEF.PL-GEN
'We threw away the closet in which I put the photos.'

This restriction is attested for relative clauses with ICA in virtually all languages where the phenomenon is present (see Bianchi (1999), Kholodilova (2013), Kholodilova & Privizentseva (2015), Deal (2016), and Abramovitz (2021)) and it distinguishes relative clauses with ICA from regular externally-headed relative clauses, which in Moksha as well as in other languages can modify a noun in its base position; see (35).

[4] One formal syntactic account of why internally-headed relative clause cannot be appositive is given in (De Vries 2006: 266, fn. 58). I will not delve into this analysis, because a syntactic account of appositive relatives there is incompatible with an analysis of relative clauses with ICA developed later in chapter 4.

(35) Min' jorda-s'k [**škaf-t'** kona-n'd'i
we[NOM] throw.away-PST.3.O.1PL.S closet-DEF.SG.GEN which-DAT
mon put-in'ə fətəgrafijə-t'n'ə-n'].
I[NOM] put-PST.3.O.1SG.S photo-DEF.PL-GEN
'We threw away the closet in which I put the photos.'

Note that left periphery is not reserved for relative clauses with ICA. Regular externally-headed relatives can also be placed there; see (36).

(36) [**Škaf-t'** kona-n'd'i mon put-in'ə
closet-DEF.SG.GEN which-DAT I[NOM] put-PST.3.O.1SG.S
fətəgrafijə-t'n'ə-n'] min' jorda-s'k.
photo-DEF.PL-GEN we[NOM] throw.away-PST.3.O.1PL.S
'We threw away the closet in which I put the photos.'

The left periphery restriction of relative clauses together with ICA groups this type of relative clauses with correlatives, which are typically located on the left (see Srivastav (1991), Dayal (1996), Lipták (2009), and Lin (2020)). The left-peripheral position is also attested for correlatives in Moksha. This is illustrated in (37).

(37) [Kona škaf-t'i mon put-in'ə fətəgrafijə-t'n'ə-n']
which closet-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 closet in which I put the photos.'

Example (38) shows that correlative clauses also cannot follow the predicate of the main clause.

(38) *Min' jorda-s'k (s'ɛ-n') [kona škaf-t'i
we[NOM] throw.away-PST.3.O.1PL.S that-GEN which closet-DEF.SG.DAT
mon put-in'ə fətəgrafijə-t'n'ə-n'].
I[NOM] put-PST.3.O.1SG.S photo-DEF.PL-GEN
'We threw away the closet in which I put the photos.'

This similarity in position of relatives with ICA and correlatives is one of the main arguments for analyzing relatives with ICA as correlatives (see Pittner (1995), Bhatt (2005), Georgi & Salzmann (2017), and also Bianchi (1999, 2000b)). However, the nature of left-peripheral position for correlatives as well as for relatives with ICA is debated: Relative clause can be either externally merged on the left (see Srivastav (1991), Dayal (1996)) or moves to the left from a position embedded into the main clause (see Bhatt (2003), Bhatt & Nash (2022)). Similarly, relative clauses with ICA could be base generated on the left as argued in Deal (2016) or moved there (see Abramovitz (2021)). In this section, I will argue that despite a common position on the left periphery, the syntax of relative clauses with ICA in Moksha is different from the syntax of correlatives. Correlative clauses are base generated on the left,

while relative clauses with ICA are generated embedded in the main clause, but obligatorily move to the left later in the derivation.

Before turning to a direct evidence for base generation versus movement, I will provide some further details on positions of relatives with ICA and correlatives. First, while both clauses are generally restricted to the left periphery, they however do not have to be to the left of a whole sentence, but can be on the left periphery of an embedded clause. This is shown in (39) for a relative clause with ICA.

(39) NOM ← GEN
Kat'ɛ az-əz'ə [što [**mašina-t'** kona-n'
Katja[NOM] say-PST.3SG.O.3SG.S that car-DEF.SG.GEN which-GEN
son rama-z'ə] aščˇ-i dvor-sə].
PRON.3SG[NOM] buy-PST.3SG.O.3SG.S be.located-NPST.3[SG] yard-IN
'Katja said that the car that she bought stands in the yard.'

Example (40) shows a correlative clause in the same position.

(40) Kat'ɛ az-əz'ə [što [kona jalga-z'ə-n'd'i
Katja[NOM] say-PST.3SG.O.3SG.S that which friend-1SG.POSS.SG-DAT
kunarə iz' zvon'-c'-an] Maša vas'ft-əz'ə
long.ago NEG.PST call-FREQ-NPST.1SG Masha[NOM] meet-PST.3SG.O.3SG.S
son'].
PRON.3SG.GEN
'Katja said that Masha met a friend whom I am not calling for a long time.'

Second, being on the left periphery, both types of relative clauses can be placed after adjuncts. This is illustrated in (41) for relatives with ICA.

(41) NOM ← GEN
Sa-j kizə-t' [**s'ora-n'ɛ-t'** kona-n'
come-PTCP.ACT summer-DEF.SG.GEN boy-DIM-DEF.SG.GEN which-GEN
Kat'ɛ tona-ft-əz'ə luv-əmə] škola-v
Katja[NOM] learn-CAUS-PST.3SG.O.3SG.S read-INF school-LAT
mol'-i.
go-NPST.3[SG]
'Next year the boy whom Katja teaches to read will go to school.'

Example (42) shows a possibility of this position for the correlative clause.

(42) Sa-j kizə-t' [kona s'ora-n'ɛ-t'
come-PTCP.ACT summer-DEF.SG.GEN which-GEN boy-DIM-DEF.SG.GEN
Kat'ɛ tona-ft-əz'ə luv-əmə] škola-v
Katja[NOM] learn-CAUS-PST.3SG.O.3SG.S read-INF school-LAT
mol'-i.
go-NPST.3[SG]
'Next year the boy whom Katja teaches to read will go to school.'

Third, Moksha speakers' judgments differ in whether arguments from the main clause can be linearly before a relative clause with ICA; see (43) and (44).

(43) NOM ← GEN
%Mez'ə [**s'ora-t'** kona-n' mon n'ɛj-in'ə is'akəmbə]
what boy-DEF.SG.GEN which-GEN I[NOM] see-PST.3.O.1SG.S yesterday
azən-c'?
tell-PST.3[SG]
'What did the boy who I saw yesterday tell?'

(44) GEN ← DAT
%Kat'ɛ [**škaf-t'i** kona-n'd'i mon put-in'ə
Katja[NOM] closet-DEF.SG.DAT which-DAT I[NOM] put-PST.3.O.1SG.S
fətəgrafijə-t'n'ə-n'] jorda-z'ə.
photo-DEF.PL-GEN throw.away-PST.3SG.O.3SG.S
'Katja threw away the closet in which I put the photos.'

The position after arguments from the main clause is unambiguously excluded for correlatives; see (45).

(45) *Kat'ɛ [kona škaf-t'i mon put-in'ə
Katja[NOM] which closet-DEF.SG.DAT I[NOM] put-PST.3.O.1SG.S
fətəgrafijə-t'n'ə-n'] jorda-z'ə (s'ɛ-n').
photo-DEF.PL-GEN throw.away-PST.3SG.O.3SG.S that-GEN
'Katja threw away the closet in which I put the photos.'

This minor difference in placement already suggests that that the nature of the left periphery requirement might be not identical for correlatives and relatives with ICA. I will now turn to differences between them.

Correlate

First, one of defining properties for correlatives is the presence of the correlate phrase in a position of a corresponding argument in the main clause (see Srivastav (1991), Dayal (1996), Lipták (2009), and Lin (2020)). This is often called a demonstrative requirement, because the correlate phrase must contain some demonstrative element in many languages. It is also attested for correlatives in Moksha, at least in some positions. The requirement is obviated in the subject and in the direct object positions, which are targeted by agreement and allow for pro-drop. The correlate is possible, but not obligatory in these positions. Examples (46)-(47) show that a correlate in the subject position and the direct object position is optional.

(46) [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[NOM] that
aš'č'-i bal'n'ica-sə.
be-NPST.3[SG] hospital-IN
'The person, whom hooligans have beaten, is in the hospital.'

(47) [Kona škaf-t'i mon put-in'ə fətəgrafijə-t'n'ə-n']
which closet-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 closet in which I put the photos.'

The correlate is obligatory in other positions. Example (48) demonstrates this for the indirect object position.

(48) [Kona sas'əda-z'ə af suv-s'-i] mon
which neighbor-1SG.POSS.SG[NOM] NEG enter-FREQ-NPST.3[SG] I[NOM]
zvon'-ən' ??(s'ɛ-n'd'i).
call-PST.1SG that-DAT
'I called my neighbor who is not coming for a while.'

In (49), a correlative clause corresponds to the argument of verb *pel'əms* 'to fear'. A noun phrase in this position can be marked by the ablative case or by the postposition that bears the ablative case and requires a genitive case marking from a noun. Example (49) shows that the correlate is obligatory in this position.

(49) [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.'

The requirement for the correlate is not attested for relative clauses with ICA. This is illustrated in (50). This example constitutes a minimal pair with (48): The relative clause in (50) corresponds to the indirect object position in the main clause and appears on the left periphery, but this sentence is fully grammatical without the demonstrative pronoun in the main clause, in contrast to (48).

(50) DAT ← NOM
[**Sas'əda-z'ə** kona af suv-s'-i]
neighbor-1SG.POSS.SG[NOM] which[NOM] NEG enter-FREQ-NPST.3[SG]
mon zvon'-ən'.
I call-PST.1SG
'I called my neighbor who is not coming for a while.'

Example (51) shows that in relatives with ICA the correlative pronoun is not needed in the ablative position as well.

(51) ABL ← GEN
[**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.'

To sum up, the data show that the presence of the correlate is obligatory in Moksha correlatives with the exception of the subject or the direct object positions, where the correlate pronoun might be absent. For relatives with ICA, the correlate is not required in any position. This contrast between correlatives and relatives with ICA

can be accounted for if a relative clause with ICA itself occupies a position in the main clause and is then moved to the left. Furthermore, the absence of a correlative in oblique positions which as shown by correlatives cannot be phonologically empty suggests that relatives with ICA are base generated in the main clause and then moved to the left periphery. But note that the obligatory presence of the correlate does not in principle exclude the possibility of base generation of the correlative clause in the main clause position: According to Bhatt (2003), correlative clauses must be first merged as adjuncts to the nominal element (the correlate) in the argument position and are then dislocated. This analysis will be, however, ruled out by the data I will present next.

Island structures: Adjunct clauses

The second difference between relative clauses with ICA and correlatives deals with where a position that the left-peripheral clause corresponds to can be. I will show that correlatives can refer to a position within an island, while relative clauses with ICA cannot and thereby pattern together with regular externally-headed relative clauses as well as with simple noun phrases that cannot move out of islands.

The data come from two island constructions: complex noun phrase islands and adjunct islands. Let's start with adjunct islands. Example (52) presents a base line. It shows a grammatical sentence with an adjunct clause and without any movement.

(52) Mon ul'-an kən'ɛr'd'-f [kədə katə-s'
I[NOM] be-NPST.1SG happy-PTCP.RES if cat-DEF.SG[NOM]
karma-j kunc'-əmə šejə̯r'-t'].
become-NPST.3[SG] catch-FREQ.INF mouse-PL
'I will be happy if the cat starts catching mice.'

Example (53) demonstrates that movement of a simple noun phrase out of the adjunct clause is ungrammatical, confirming that adjunct clauses are opaque for movement.

(53) * [Katə-s'] mon ul'-an kən'ɛr'd'-f [kədə __
cat-DEF.SG[NOM] I[NOM] be-NPST.1SG happy-PTCP.RES if
karma-j kunc'-əmə šejə̯r'-t'].
become-NPST.3[SG] catch-FREQ.INF mouse-PL
'I will be happy if the cat starts catching mice.'

Adjunct clauses are also opaque for relative clauses with ICA. In (54), the relative clause is on the left periphery, but it corresponds to a position inside the adjunct island. The sentence is ungrammatical.

(54) NOM ← GEN
* [Katə-**t'** kona-n' t'ejə-n kaz'-əz']
cat-DEF.SG.GEN which-GEN PRON.DAT-1SG.POSS gift-PST.3.O.3PL.S
mon ul'-an kən'ɛr'd'-f [kədə __ karma-j
I[NOM] be-NPST.1SG happy-PTCP.RES if become-NPST.3[SG]

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

The same restriction applies to regular externally-headed relative clauses; see (55).

(55) * [Katə-s' kona-n' t'ejə-n kaz'-əz']
cat-DEF.SG[NOM] which-GEN PRON.DAT-1SG.POSS gift-PST.3.O.3PL.S
mon ul'-an kən'ɛr'd'-f [kədə __ karma-j
I[NOM] be-NPST.1SG happy-PTCP.RES if become-NPST.3[SG]
kunc'-əmə šejə̯r'-t'].
catch-FREQ.INF mouse-PL
'I will be happy if the cat that they gifted to me starts catching mice.'

Correlative clauses in Moksha are not subject to this restriction. As shown in (56), they can refer to a position inside the adjunct clause. To minimize the differences to noun phrases and other types of relative clauses, there is no correlate in the embedded clause, which is allowed here, because the relative clause corresponds to the subject position.

(56) [Kona katə-t' t'ejə-n kaz'-əz'] mon
which cat-DEF.SG.GEN PRON.DAT-1SG.POSS gift-PST.3.O.3PL.S I[NOM]
ul'-an kən'ɛr'd'-f [kədə __ karma-j
be-NPST.1SG happy-PTCP.RES if become-NPST.3[SG]
kunc'-əmə šejə̯r'-t'].
catch-FREQ.INF mouse-PL
'I will be happy if the cat that was gifted to me starts catching mice.'

Island structures: Complex noun phrases

The same effect is observed with complex noun phrase islands. I will use regular externally-headed relative clauses as an instance of a complex noun phrase. The base line without movement is shown in (57).

(57) Mon soda-sa s'ɛ loman'-t' [kona
I[NOM] know-NPST.3SG.O.1SG.S that person-DEF.SG.GEN which[NOM]
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.'

The islandhood of regular externally-headed relative clauses in Moksha is illustrated in (58), where movement of a simple noun phrase out of it is shown to be ungrammatical.

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

'I know that person who kicked out the dog.'

Example (59) demonstrates that the relative clause with ICA being on the left periphery of the whole sentence cannot correspond to an argument position inside the embedded relative clause.

(59) GEN ← DAT
* [Pin'ə-**t'i** kona-n'd'i maks-in'ə jaŗca-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[NOM] know-NPST.3SG.O.1SG.S that person-DEF.SG.GEN which[NOM]
pan'-əz'ə __].
kick.out-PST.3SG.O.3SG.S
'I know that person who kicked out the dog that I gave food.'

The same restriction holds for regular externally headed relative clauses; see (60).

(60) * [Pin'ə-t' kona-n'd'i maks-in'ə jaŗca-ma-t']
dog-DEF.SG.GEN which-DAT give-PST.3.O.1SG.S eat-NZR-DEF.SG.GEN
mon soda-sa s'ɛ loman'-t' [kona
I[NOM] know-NPST.3SG.O.1SG.S that person-DEF.SG.GEN which[NOM]
pan'-əz'ə __].
kick.out-PST.3SG.O.3SG.S
'I know that person who kicked out the dog that I gave food.'

Correlative clauses, on the contrary, are not subject to this restriction. They can be on the left periphery and refer to a position inside a complex noun phrase island; see (61). Note that as with simple noun phrases and other types of relative clauses, there is no correlate in the embedded position.

(61) [Kona pin'ə-t'i maks-in'ə jaŗca-ma-t'] mon
which dog-DEF.SG.DAT give-PST.3.O.1SG.S eat-NZR-DEF.SG.GEN I[NOM]
soda-sa s'ɛ loman'-t' [kona
know-NPST.3SG.O.1SG.S that person-DEF.SG.GEN which[NOM]
pan'-əz'ə __].
kick.out-PST.3SG.O.3SG.S
'I know that person who kicked out the dog that I gave food.'

Thus, the data show that left-peripheral relative clauses with ICA cannot correspond to a position within an island, while this is grammatical for correlative clauses. The pattern is replicated for adjunct islands and complex noun phrase islands. This difference between these types of relative clauses automatically follows if the left-peripheral position of relatives with ICA, but not correlatives is derived by movement: Relatives with ICA are first merged in a regular argument position and are then moved to the left periphery, so that they are subject to the same locality constraints that apply to movement in general, including movement of simple noun phrases and regular externally-headed relative clauses in Moksha. Insensitivity of correlative

clauses to movement restrictions suggests that they are base generated on the left and their relation to a corresponding embedded position is semantic, e.g., one of variable binding (see Srivastav (1991), Dayal (1996)). Variable binding can apply into island structures in Moksha. This is shown in (62), where a quantified noun phrase in the main clause binds a variable pronoun in the relative clause.

(62) **Ɛr' učən'ik-s'$_i$** n'ɛj-əz'ə ac'ənkə-nc
every student-DEF.SG[NOM] see-PST.3SG.O.3SG.S grade-3SG.POSS.SG.GEN
[kona-n' učit'əl-s' put-əz'ə
which-GEN teacher-DEF.SG[NOM] put-PST.3SG.O.3SG.S
son'-d'ejə-nzə$_i$].
PRON.3SG-PRON.DAT-3SG.POSS
'Every student$_i$ saw the grade that the teacher gave him$_i$.'

Variable binding

The third difference between relative clauses with ICA and correlatives comes from variable binding. A simple case of variable binding in Moksha is illustrated in (63).

(63) **Ɛr'** s'ora-n'ɛ-s'$_j$ soda-si što **son'$_{i/j}$**
every boy-DIM-DEF.SG[NOM] know-NPST.3SG.O.3SG.S that PRON.3SG.GEN
d'ɛd'a-c kurəl sa-j.
mother-3SG.POSS.SG[NOM] soon come-NPST.3[SG]
'Every boy$_j$ knows that his$_{i/j}$ mother will come soon.'

In this example, the quantified noun phrase c-commands the third person pronoun and the latter can be interpreted as a variable co-indexed with the quantified noun phrase. Such an interpretation of the pronoun is not possible in (64), which differs in that the pronoun is not c-commanded by the quantified noun phrase.

(64) **Son'$_{i/*j}$** kn'iga-c aščʲ-i **ɛr'**
PRON.3SG.GEN book-3SG.POSS.SG[NOM] be-NPST.3[SG] every
s'ona-n'ɛ-t'$_j$ komnata-sə-nzə.
boy-DIM-DEF.SG.GEN room-IN-3SG.POSS
'His$_{i/*j}$ book is in every boy's$_j$ room.'

A contrast between (63) and (64) suggests that for variable binding to succeed a quantified noun phrase must c-command a variable. I will return to variable binding in the next chapter, where I will investigate the derivational path of the head noun. In section 3.3.3, I will talk about conditions on variable binding in more detail and present some examples where a bound variable interpretation is possible despite an absence of the c-command between a quantified noun phrase and a pronoun. For now, I will, however, make a simplistic assumption that variable binding indeed applies under c-command (see Chomsky (1981) and Reinhart (1983)), and as the contrasts between different types of relative clauses are clear, I will draw conclusions about the base position of the relative clause on the basis of variable binding.

With these assumptions in mind, I will now turn to the data. They show that the variable inside the relative clause with ICA can be bound by a quantified noun phrase in the main clause and this is despite the fact that the bound variable is in the left-peripheral clause, where it is not c-commanded by the quantified noun phrase. This is shown in (65), where the pronominal subject in the relative CP co-varies with the quantified subject of the main clause giving raise to an interpretation under which each boy and not some third person gave food to the dog.

(65) GEN ← DAT
[Pin'ə-**t'i** kona-n'd'i **son$_i$** maks-əz'ə
dog-DEF.SG.DAT which-DAT PRON.3SG[NOM] give-PST.3SG.O.3SG.S
jaṛcambɛl'-t'] **ɛr'** **s'ora-n'ɛ-s'$_i$** mɛl'aft-əz'ə.
food-DEF.SG.GEN every boy-DIM-DEF.SG[NOM] remember-PST.3SG.O.3SG.S
'Every boy$_i$ remembered the dog that he$_i$ gave food.'

A pronoun inside a correlative clause, on the contrary, cannot co-vary with the quantified noun phrase in the main clause. Example (66) has the single interpretation, under which some third person fed the dog.

(66) [Kona pin'ə-t'i **son$_{j/*i}$** maks-əz'ə
which dog-DEF.SG.DAT PRON.3SG[NOM] give-PST.3SG.O.3SG.S
jaṛcambɛl'-t'] **ɛr'** **s'ora-n'ɛ-s'$_i$** mɛl'aft-əz'ə.
food-DEF.SG.GEN every boy-DIM-DEF.SG[NOM] remember-PST.3SG.O.3SG.S
'Every boy$_i$ remembered the dog that he$_{j/*i}$ gave food.'

Regular externally-headed relative clauses trivially allow binding of a variable inside the relative clause by a quantified noun phrase from the main clause. This is shown in (67) for the relative clause in the argument position.

(67) **Ɛr'** **s'ora-n'ɛ-s'$_i$** mɛl'aft-əz'ə
every boy-DIM-DEF.SG[NOM] remember-PST.3SG.O.3SG.S
[pin'ə-t' kona-n'd'i **son$_i$** maks-əz'ə
dog-DEF.SG.GEN which-DAT PRON.3SG[NOM] give-PST.3SG.O.3SG.S
jaṛcambɛl'-t'].
food-DEF.SG.GEN
'Every boy$_i$ remembered the dog that he$_i$ gave food.'

Example (68) shows that the binding applies in the same way if the relative clause is dislocated to the left. Here, as in the previous example, binding of a pronoun gives rise to the interpretation, where boys fed the dog themselves.

(68) [Pin'ə-t' kona-n'd'i **son$_i$** maks-əz'ə
dog-DEF.SG.GEN which-DAT PRON.3SG[NOM] give-PST.3SG.O.3SG.S
jaṛcambɛl'-t'] **ɛr'** **s'ora-n'ɛ-s'$_i$** mɛl'aft-əz'ə.
food-DEF.SG.GEN every boy-DIM-DEF.SG[NOM] remember-PST.3SG.O.3SG.S
'Every boy$_i$ remembered the dog that he$_i$ gave food.'

Thus, for left-peripheral clauses, variable binding is possible into relatives with

ICA as well as into regular externally-headed relative clause, but not into correlatives. This pattern is straightforwardly accounted for if relative clauses with ICA are generated in an argument position of the main clause. In this position, a variable is c-commanded by a quantified noun phrase and can be bound before the relative clause takes its position on the left edge. Correlatives, on the contrary, are first merged on the left and are never c-commanded by a material in the main clause. In result, the variable in the correlative CP cannot be bound by the material in the main clause.

Anaphor binding into the head noun

There are two further arguments that provide an evidence for movement of relative clauses with ICA to the left edge. These arguments differ from those presented so far in that comparable data on correlative clauses are not available.

The first of such arguments comes from binding of an anaphor in the head noun. Example (69) shows that this is possible for relative clauses with ICA: The head noun contains the reflexive *es'*, which it is interpreted as being bound by the subject of the main clause. This suggests that despite the left-peripheral position on the final structure, the relative clause appears in a position c-commanded by the subject of the main clause at some stage in the derivation.

(69) GEN ← DAT
[**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[NOM]
Vas'ɛ$_i$ dagə pet'-əz'ə.
Vasja[NOM] again repair-PST.3SG.O.3SG.S
'Vasja$_i$ again repaired his$_i$ car that a lot of money was invested into.'

Example (70) illustrates that binding is also possible for a regular externally-headed relative clause.

(70) [**Es'$_i$** mašina-**nc** kona-n'd'i put-f lama jarmak]
self car-3SG.POSS.SG.GEN which-GEN put-PTCP.RES many money[NOM]
Vas'ɛ$_i$ dagə pet'-əz'ə.
Vasja[NOM] again repair-PST.3SG.O.3SG.S
'Vasja$_i$ again repaired his$_i$ car that a lot of money was invested into.'

The anaphor binding suggests that independently of the case on the head noun, relatives are base generated in a regular argument position in the main clause.

Coordination

The final argument comes from coordination. The data are given in (71) and (72). In both examples, a head noun with an internal case is coordinated with a noun phrase that in turn shows a case assigned in the main clause. The main clause case is

genitive and the attracted case is dative in these examples. They differ in the order of conjuncts ensuring that it is not a relevant factor. In (71), the relative clause is the first conjunct and a simple noun phrase is the second one:

(71) GEN ← DAT
[Osal pin'ə-**t'i** kona-n'd'i ton maks-at jaŗca-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.'

The order of conjuncts is reverse in (72): A simple noun phrase is the first conjunct, while the relative clause clause is the second one.

(72) GEN ← DAT
[Ečkə **katə-t'**] i [osal pin'ə-**t'i** kona-n'd'i ton
thick cat-DEF.SG.GEN and skinny dog-DEF.SG.DAT which-DAT you
maks-at jaŗca-ma] mon soda-sajn'ə.
give-NPST.2SG eat-NZR I know-NPST.3PL.O.1SG.S
'I know the skinny dog that you give food and the fat cat.'

In both examples, the predicate of the main clause has a plural object agreement marker. This excludes an account under which these examples involve a coordination of CPs and all material from one of the clauses except for the left-dislocated noun phrase is elided as in *[$_{CP}$ the fat cat ~~I know~~] and [$_{CP}$ the skinny dog that I gave food I know]*. Thus, the regular case from the main clause on the noun that is coordinated to the relative clause with ICA argues that the whole coordination (*the cat and the skinny dog that I gave food*) must have been in a case assignment position in the main clause at some step of the derivation. This excludes the base merge of relative clauses with ICA on the left periphery.

Example (73) shows that such coordination is also trivially possible for regular externally-headed relative clauses.

(73) [Ečkə **katə-t'**] i [osal pin'ə-t' kona-n'd'i ton
thick cat-DEF.SG.GEN and skinny dog-DEF.SG.GEN which-DAT you
maks-at jaŗca-ma] mon soda-sajn'ə.
give-NPST.2SG eat-NZR I know-NPST.3PL.O.1SG.S
'I know the skinny dog that you give food and the fat cat.'

Summary

To sum up, in this section I have investigated positional properties of relative clauses with ICA. I have shown that they are obligatorily positioned on the left periphery. This constitutes a major difference between them and regular externally-headed relatives that can appear in argument positions of a main clause. Furthermore, position on the left periphery patterns relatives with ICA together with correlative

clauses that are also obligatorily positioned on the left. I have argued that despite the common position on the left, relatives with case attraction and correlatives differ in that correlative clauses are base generated on the left periphery, while relatives with ICA are moved there. The evidence comes from the five empirical phenomena and is summarized in table (74).

(74) Properties of left-peripheral relatives

	ICA	Regular externally-headed	Correlatives
1. Obligatory correlate in positions other than subject and direct object	no	no	yes
2. Base position inside an island structure	*	*	OK
3. Variable binding into the relative CP	OK	OK	*
4. Anaphor binding into the head noun	OK	OK	
5. Coordination with a noun phrase marked for a regular case	OK	OK	

I conclude that correlatives have structure (75): They are base merged on the left; the position of the correlate and the relative clause are not related by movement.

(75) Correlative clauses
[$_{CP}$ ... correlative clause ...] [$_{MC}$ ... correlate ...]

Relative clauses with ICA, on the other hand, have a derivation illustrated in (76a-b). The relative clause is first merged in a regular noun phrase position in the main clause (see (76a)), and moves to the left later in the derivation giving rise to the structure in (76b).

(76) Relative clauses with ICA

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

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

Before turning to other properties of relatives with ICA in the next section, I would like to briefly talk about cross-linguistic variation in relative clauses with ICA. Kholodilova (2013) and Kholodilova & Privizentseva (2015) discuss ICA in other Finno-Ugric languages. They show that it is also restricted to the left edge position in Ingrian Finnish and Beserman Udmurt and provide data on coordination of a relative clause with a noun phrase marked for a regular external case, suggesting

that left-peripheral position also results from movement in these languages as well. Abramovitz (2021) provides a detailed discussion of relatives with ICA in Koryak and suggests that the Koryak data also point towards the movement account. In particular, he shows that ICA is well-attested in the language, but a construction with a noun phrase base merged on the left periphery is accepted only by some speakers and unlike ICA requires a pronoun in a corresponding position. Relatives with ICA in Nez Perce seem to be different. Deal (2016) argues that relatives with ICA are base generated on the left in this language. The main argument comes from the fact that relatives with ICA can refer to a position inside an island. One potential caveat of the argumentation is that such a behavior is not shown to be ungrammatical for regular externally-headed relatives or simple topicalized nouns marked for a regular case. The islandhood of relative clauses and adjuncts is illustrated by other movement types – relativization and wh-movement. This leaves open an alternative interpretation under which relatives with ICA move to the left periphery after all, but different types of movement have different locality restrictions (see, e.g., Keine (2019)).[5] At the same time, if relative clauses with ICA are indeed base generated on the left periphery in Nez Perce and relative clauses with ICA have therefore somewhat different properties cross-linguistically, this would also be a rather trivial state of affairs as superficially similar phenomena often show different properties under closer examination; compare, for instance, cross-linguistic variation in passive structures (see Legate (2021)) or in pseudo-noun incorporation phenomena (see Driemel (2020)).

2.3.3 Extraposition and coordination

In this subsection, I will continue to investigate the properties of relative clauses with ICA and turn to constituency diagnostics that are meant to examine a relation between the head noun and the relative CP: extraposition and coordination.

I will start with extraposition. An extraposed relative CP is separated from its head noun by a further main clause material. In the simplest case, extraposition of a relative CP is supposed to show that there is a relative constituent that does not include a head noun; cf. the schematic representation in (77). Extraposition thus appears to be a good diagnostic for the position of the head noun inside or outside of the relative CP.

(77) $[_{\text{MC}}$ ... head-noun ... *further main clause material* ... $[_{\text{relative CP}}$ ...]]

[5]The same logic could in principle apply to the data presented above: Both RCs with ICA and correlatives move to the left, but movement of correlative clauses involves a different type of movement or targets a different position and shows different locality restrictions in result. Such approach is untenable for Moksha. First, potential movement of correlative clauses would be topicalization, i.e., the same movement type as displacement of simple noun phrases in (53) and (58). Second, the difference between RCs with ICA and correlatives is further confirmed by the possibility of variable binding.

In fact, however, the picture is less straightforward. On the empirical side, there is a class of raising relative clauses that do not allow for extraposition of the relative CP (see Hulsey & Sauerland (2006)), but have a structure under which a final landing site of a head noun is outside of a relative CP, at least according to some of the analyses (see Bhatt (2002), Deal (2016)). On the theoretical side, extraposition as in (77) can be also derived without movement of the relative CP rightwards. For instance, according to the analysis by Kayne (1994), extraposted relative CPs are in a base position of the relative construction and it is the head noun that moves to the left.

Acknowledging these problems, let's nevertheless look at the empirical picture in Moksha. Data show that extraposition is not allowed for relative clauses with ICA; see (78a) with extraposition of the relative CP and the corresponding grammatical example (78b) without extraposition.

(78) a. NOM ← DAT
*__S't'ər'-n'ɛ-t'i__ tu-s' kaftə n'ed'ɛl'a-t [__kona-n'd'i__
girl-DEF.SG.DAT go-PST.3[SG] two week-PL which-DAT
maks-in'ə kel'gəma kn'iga-z'ə-n'].
give-PST.3.O.1SG.S favorite book-1SG.POSS.SG-GEN
'The girl left for two weeks, whom I gave my favorite book.'

b. NOM ← DAT
__S't'ər'-n'ɛ-t'i__ __kona-n'd'i__ maks-in'ə kel'gəma
girl-DEF.SG.DAT which-DAT give-PST.3.O.1SG.S favorite
kn'iga-z'ə-n' tu-s' kaftə n'ed'ɛl'a-t.
book-1SG.POSS.SG-GEN go-PST.3[SG] two week-PL
'The girl whom I gave my favorite book left for two weeks.'

At the same time, regular externally-headed relative clauses in Moksha allow for extraposition of the relative CP; see (79).

(79) __S't'ər'-n'ɛ-s'__ tu-s' kaftə n'ed'ɛl'a-t [__kona-n'd'i__
girl-DEF.SG[NOM] go-PST.3[SG] two week-PL which-DAT
maks-in'ə kel'gəma kn'iga-z'ə-n'].
give-PST.3.O.1SG.S favorite book-1SG.POSS.SG-GEN
'The girl left for two weeks, whom I gave my favorite book.'

The ungrammaticality of extraposition in relatives with ICA might be due to their derived left-peripheral position; see a contrast in extraposition depending on wh-movement of the head noun outlined in English (Baltin 1978: 82). This analysis is unlikely to be correct for Moksha, because extraposition remains possible if a head of a regular externally-headed relative clause is moved to the left; see (80).[6]

[6]There might be an alternative derivation for this example: The head noun moves to the left, while the relative CP simply remains in situ. If so, the sentence does not illustrate the intended derivation, where the full noun phrase first moves to the left and then the relative CP is extracted to the right. This analysis is unexpected given that wh-movement usually targets full DPs and the DP clearly includes a relative CP as well. Under this analysis, the ban on extrapositon for RCs with ICA would raise a different question: Why movement of the head noun with stranding of the relative CP is possible for

(80) **Kin'** **pin'ə-ncti** ton maks-it' jaŗca-ma-t'
who.GEN dog-3SG.POSS.SG you give-PST.3.O.2SG.S food-NZR-DEF.SG.GEN
[kona t'ɛn'i ašč-i dvor-sə].
which[NOM] now be-NPST.3[SG] yard-IN
'To whose dog that is now in the yard you gave food?'

Instead, I would like to suggest that the ban on extraposition of relatives with ICA is yet another case of the ban on extraposition for raising relatives (see Hulsey & Sauerland (2006), Takahashi & Hulsey (2009) as well as Henderson (2007)); that is, for relatives which head is first merged in the relative CP and then moves to a higher position. So far, I did not talk about the derivational path of the head noun, but I will argue that relatives with ICA are derived via raising in the next chapter. I will correspondingly present a full-fledged analysis of the ban on extraposition after this, in chapter 4. Now, I will briefly preview the analysis. It is based on the approach to extraposition by Fox & Nissenbaum (1999), under which extraposition is derived by merging an extraposed constituent to its host late, after the host is moved to the right. It is syntactically present, but is not phonologically realized in this position. This analysis predicts the ban on extraposition of raising relatives: The head of such relatives moves from inside the relative CP and therefore cannot be merged to the main clause before it merges with the relative CP. The derivation path of the head noun thus excludes the extraposition of the relative CP under this account. The final position of the head noun can be outside of a relative CP, so that extraposition does not diagnose constituency as originally intended.

Another constituency diagnostic I will be talking about in this section is coordination. Data show that coordination of two relative clauses under the same head is possible for both relatives with ICA (see (81a)) and regular externally-headed relatives (see (81b)). In example (81a) with ICA, the case assigned to the relativized participant is the same in both relative CPs.

(81) a. NOM ← GEN
Jalga-t' [**kona-n'** vɛt'-in'ə kud-u] i
friend-DEF.SG.GEN which-GEN bring-PST.3.O.1SG.S house-LAT and
[**kona-n'** and-in'ə l'ɛm-də] kurək n'i
which-GEN feed-PST.3.O.1SG.S soup-ABL soon already
tu-j.
go-NPST.3[SG]
'The friend that I brought home and that I gave soup is leaving soon.'

b. **Jalga-s'** [**kona-n'** vɛt'-in'ə kud-u] i
friend-DEF.SG[NOM] which-GEN bring-PST.3.O.1SG.S house-LAT and
[**kona-n'** and-in'ə l'ɛm-də] kurək n'i
which-GEN feed-PST.3.O.1SG.S soup-ABL soon already
tu-j.
go-NPST.3[SG]
'The friend that I brought home and that I gave soup is leaving soon.'

regular externally-headed relatives, but not for relatives with ICA.

Taken at face value, data in (81) seem to argue that the head noun is outside of the relative CP: One noun heads two coordinated CPs and must therefore be outside of them. In fact, approaches positioning the head on the left edge, but inside the relative CP can derive these data by assuming that the realized head is inside the first conjunct, while the head inside the second conjunct is deleted under identity; see Borsley (1997) and Bianchi (2000a,b). An argument against such an approach comes from the data in (82). Examples present a coordination of two relative CPs with different cases assigned to a relativized constituent and show that under ICA the head noun can be marked for either of the two cases. Specifically, the case from the second conjunct on the head noun in (81b) excludes that the head is inside the first conjunct.

(82) a. NOM ← GEN
Jalga-t' [**kona-n'** vɛt'-in'ə kud-u] i
friend-DEF.SG.GEN which-GEN bring-PST.3.O.1SG.S house-LAT and
[**kona-n'd'i** n'ɛft'-in'ə od škaf-t'] kurə
which-DAT show-PST.3.O.1SG.S new cupboard-DEF.SG.GEN soon
n'i tu-j.
already go-NPST.3[SG]
'The friend who I brought home and whom I showed the new cupboard is going to leave soon.'

b. NOM ← DAT
Jalga-t'i [**kona-n'** vɛt'-in'ə kud-u] i
friend-DEF.SG.DAT which-GEN bring-PST.3.O.1SG.S house-LAT and
[**kona-n'd'i** n'ɛft'-in'ə od škaf-t'] kurək
which-DAT show-PST.3.O.1SG.S new cupboard-DEF.SG.GEN soon
n'i tu-j.
already go-NPST.3[SG]
'The friend who I brought home and whom I showed the new cupboard is going to leave soon.'

However, these data do not exclude an analysis under which examples show coordination of constituents smaller than the full CP, so that the head is above coordinated phrases but still inside the relative CP (see Bianchi (2000a,b)). Finally, this diagnostic is also complicated by the raising analysis of relatives with ICA envisaged above: If the head noun moves from within the relative CP, coordination of two relative CPs under the same head involves an ATB-movement. Analyses of this phenomenon often postulate some representation of the moved constituent within both conjuncts (see De Vries (2017) and Georgi (2019) for recent overviews).

To sum up, in this section I have tested relative clauses with ICA against two standard constituency diagnostics and have shown that at the first sight extraposition favors the position of the head noun inside the relative clause, while coordination outside of it. In fact, however, none of these diagnostics provides a convincing evidence for internally-headed or externally-headed analysis of relatives with ICA.

2.3.4 Extraction out of the relative clause

In this section, I will turn to the last and seemingly the most convincing argument in favor of the relative clause internal position of the head noun in relatives with ICA. The argument was presented by Abramovitz (2021) (see also Belyaev (2012)) and builds on the possibility to place a material from inside the relative CP to the left of the head noun with an internal case; see (83) and (84). In (83), adjunct *bibl'iat'eka-stə* 'library-EL' precedes the head noun.

(83) NOM ← DAT
Bibl'iat'eka-stə **jalga-z'ə-n'd'i** kona-n'd'i mon
library-EL friend-1SG.POSS.SG-DAT which-DAT I[NOM]
sɛv-in'ə kn'iga-t' __ kelk-si
take-PST.3.O.1SG.S book-DEF.SG.GEN love-NPST.3SG.O.3SG.S
luv-əm-s.
read-INF-ILL
'My friend for whom I took the book from the library loves to read.'

Similarly in (85), the adverb *is'ak* 'yesterday' semantically belongs to the predication inside the relative clause, but is placed before the head noun.

(84) NOM ← GEN
Is'ak mon' **al'ɛ-z'ə-n'** kona-n' šav-əz'
yesterday I.GEN father-1SG.POSS.SG-GEN which-GEN beat-PST.3.O.3PL.S
__ hul'iga-t'n'ə t'ɛn'i aščˇ-i bal'n'ica-sə.
hooligan-DEF.PL[NOM] now be-NPST.3[SG] hospital-IN
'My father, whom hooligans have beaten yesterday, is in the hospital.'

This contrasts with the behavior of regular externally-headed RCs: Adjuncts cannot be to the left of the head in regular externally-headed relatives; see (85) and (86).

(85) *Bibl'iat'eka-stə **jalga-z'ə** [kona-n'd'i mon
library-EL friend-1SG.POSS.SG[NOM] which-DAT I[NOM]
sɛv-in'ə kn'iga-t' __] kelk-si
take-PST.3.O.1SG.S book-DEF.SG.GEN love-NPST.3SG.O.3SG.S
luv-əm-s.
read-INF-ILL
'My friend for whom I took the book from the library loves to read.'

(86) *Is'ak mon' al'ɛ-z'ə [kona-n' šav-əz'
yesterday I.GEN father-1SG.POSS.SG[NOM] which-GEN beat-PST.3.O.3PL.S
__ hul'iga-t'n'ə] t'ɛn'i aščˇ-i bal'n'ica-sə.
hooligan-DEF.PL[NOM] now be-NPST.3[SG] hospital-IN
'My father, whom hooligans have beaten yesterday, is in the hospital.'

Abramovitz (2021) assumes that adjuncts are inside the relative CP, in one of the split-CP projections. If so, the possibility to position adjuncts to the left of the head noun unambiguously indicates that the head noun is inside the relative CP.

Consequently, relatives with ICA are internally-headed and the contrast with regular externally-headed relatives further supports this conclusion.

Such an analysis is however argued against by the data in (87). They show that the key assumption that displaced adverbs are inside the relative CP is not supported empirically. In this example, *bibl'iat'eka-stə* 'library-EL' is separated from the relative CP by a further material that clearly does not belong to the relative clause. These data show that adjuncts move out of the relative CP.

(87) NOM ← GEN
Bibl'iat'eka-stə mon ar's'-an [čtə [**kn'iga-t'**
library-EL I[NOM] think-NPST.3[SG] that book-DEF.SG.GEN
kona-n' sɛv-əz'ə __ Kat'ɛ] ašč-i stol-sə].
which-GEN 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.'

This conclusion that adjuncts can move out of relative clauses is surprising given that relative clauses are one of the classical examples of island structures so that extraction out of them must be ruled out (see Ross (1967)). At the same time, numerous cases of extraction out of relative clauses is discussed in the literature showing that it is a well-attested, but heavily restricted phenomenon; see Erteschik-Shir (1973), McCawley (1981), Engdahl (1997), Cinque (2010), Kush, Omaki, & Hornstein (2013), Sichel (2018), Vincent (2021). Sichel (2018) relates extraction out of relative clauses with the raising derivation that as I will argue in the next chapter relatives with ICA instantiate. I suggest that the placement of adjuncts from inside the relative CP to the left of the head noun illustrates extraction out of the relative CP and thus does not argue for the relative CP internal position of the head noun.

Before concluding this section, I will present two further data points on extraction out of relatives with ICA. First, native speakers' judgments differ with respect to what can be extracted. While all speakers allow for extraction of adjuncts, extraction of arguments is accepted by some speakers and ruled out by the others.

(88) NOM ← GEN
%Kat'ɛ **kn'iga-t'** kona-n' __ sɛv-əz'ə
Katja book-DEF.SG.GEN which-GEN take-PST.3SG.O.3SG.S
bibl'iat'eka-stə ašč-i stol-sə.
library-EL be-NPST.3[SG] table-IN
'The book that Katja took from the library is on the table.'

Extraction of arguments is excluded for regular externally-headed relatives by all speakers.

(89) *Kat'ɛ kn'iga-s' [kona-n' __ sɛv-əz'ə
Katja book-DEF.SG[NOM] which-GEN take-PST.3SG.O.3SG.S
bibl'iat'eka-stə] ašč-i stol-sə.
library-EL be-NPST.3[SG] table-IN
'The book that Katja took from the library is on the table.'

Second, speakers that prohibit extraction of arguments also do not allow for moved syntactic objects to contain elements that must reconstruct to a position inside the relative CP. In (90), the extracted constituent contains an anaphor that should, but cannot be bound inside the relative CP.

(90) NOM ← DAT

*Es'$_i$ bibl'iat'eka-stə **jalga-z'ə-n'd'i** kona-n'd'i Kat'ɛ$_i$
self library-EL friend-1SG.POSS.SG-DAT which-DAT Katja[NOM]
sɛv-əz'ə kn'iga-t' __ kelk-si
take-PST.3SG.O.3SG.S book-DEF.SG.GEN love-NPST.3SG.O.3SG.S
luv-əm-s.
read-INF-ILL
'My friend for whom Katja took the book from her library loves to read.'

I will present a detailed analysis of the extraction data in chapter 4, when the stage for this will be set up. For now, I will just briefly preview the account. I assume the Phase Impenetrability Condition, according to which complements of phase heads are rendered inaccessible as the derivation goes on, so that all extraction out of phases must proceed through their edges (see Chomsky (2000, 2001)). I also assume that CPs as well as DPs (see Svenonius (2004), Matushansky (2004), Bošković (2014)) are phases. Against this background, I suggest that, at least in Moksha, edge features that allow syntactic objects to move to the edge of a DP are accessible only after this DP is assigned case. As heads of relative clauses with ICA have case from inside the relative clause, their edge features are readily available, when DPs are first build. Heads of regular externally-headed relative clauses, on the contrary, receive case from higher projections in the main clause. In result, when a head noun gets case and its edge features become in principle available, the DP is a proper subpart of the existing structure, so that movement to Spec,DP would be counter-cyclic and thus impossible.[7]

As for restrictions on which syntactic objects can be extracted, the difference between the two systems presented by the data stems from the ability to move an element to the edge of the relative CP across the relative pronoun. This must be possible for speakers who allow extraction of all syntactic objects, but is excluded for speakers who ban extraction of arguments. I hypothesize that for the latter movement across the relative pronoun is excluded due to (defective) intervention (see Starke (2001), Rizzi (2004), Haegeman (2012)), so that movement out of the relative clause is restricted to adjuncts, which can be born in the edge domain. This analysis is supported by the fact that anaphors in the extracted syntactic objects cannot be bound inside the relative clause.

[7]Note that while this analysis derives a selective opacity of relative clauses in Moksha, it does not extend to limited extraction out of relative clauses in other languages. I assume that there are various reasons cross-linguistically that allow for extraction out of otherwise opaque complex noun phrase islands.

2.4 Taking stock

2.4.1 Summary

The goal of this chapter was to investigate the properties of relative clauses with ICA that are relevant for determining their structure. We were particularly interested in the final position of the head noun inside or outside the relative CP and, thus, in whether relatives with ICA instantiate the externally-headed, the regular internally-headed, or the correlative structure.

The first set of properties presented in this chapter deals with the interpretation of relative clauses. The data have shown that relatives with ICA allow for the restrictive and the appositive interpretation and thereby pattern together with regular externally-headed relative clauses with respect to available interpretations and related diagnostics such as stacking and restrictions on the type of the head noun. I have claimed the appositive interpretation of relatives with ICA argues against internally-headed analysis for them, because the appositive reading is cross-linguistically excluded for internally-headed relative clauses.

The second set of properties concerns the position of the relative clause. I have shown that relative clauses with ICA are obligatorily positioned to the left of the main clause. Left-peripheral position seems to group them together with correlatives. I have however shown that the two types of relatives differ in that relatives with ICA are moved to the left periphery, while correlatives are base generated there. The similarity between relative clauses with ICA and correlatives is therefore superficial; the underlying syntax is different. I conclude that the left-peripheral position of relatives with ICA does not argue for the internally-headed structure.

Third, I have looked at the two constituency diagnostics that are usually applied to relative clauses: extraposition and coordination. At the first sight, the data point in different directions: The ban on extraposition suggests that the head noun is part of the relative CP, but coordination of two relative CPs under one head indicates that the head noun is outside of the relative CP. The discussion of diagnostics and underlying syntactic structures revealed that none of them in fact gives an argument for the final position of the head noun inside or outside the relative CP. In particular, the ban on extraposition can follow from the late merge approach of an extraposed constituent (see Fox & Nissenbaum (1999)) combined with the raising derivation of relative clauses.

The fourth and final piece of data deals with extraction out of the relative CP. It differentiates between relatives with ICA and regular externally-headed relatives in Moksha, but does not argue for the relative-clause internal position of the head noun: Numerous cases of extraction out of externally-headed relatives are attested cross-linguistically and differences in extraction can follow from the different timing of case assignment to the head noun (see chapter 4 for the detailed analysis).

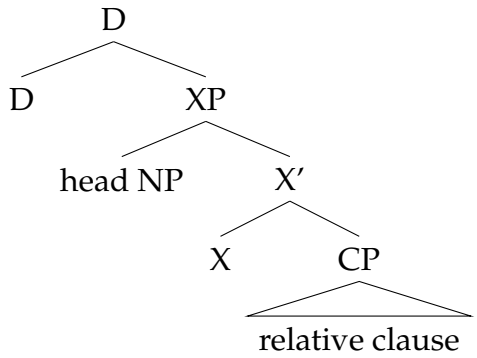
To sum up: Despite some superficial similarities between relative clauses with

ICA and internally-headed relatives, there are no arguments that unequivocally group them together and none of the properties of relative with ICA requires to position the head noun inside the relative CP. On the contrary, the interpretation and syntactic properties related to it show that relative clauses with ICA have a profile of externally-headed relatives. I conclude that relative clauses with ICA are most naturally analyzed as externally-headed.

2.4.2 Structures for externally-headed relatives

With this conclusion in hand, let's look at structures for externally-headed relative clauses. They can vary in a number of ways. First, a relative clause can be a complement or an adjunct of the head noun (see Alexiadou, Law, Meinunger, & Wilder (2000) and Salzmann (2014, 2017: 46-48) for recent overviews). Second, a relative clause can be attached at different places. The attachment sometimes correlates with the interpretation of a relative clause (cf. Partee (1975, 2015) and Jackendoff (1977)): Appositive relative clauses are often assumed to be attached higher in the nominal projections (e.g., a DP), while restrictive relatives modify a lower nominal projection (e.g., an NP). Here I would like to talk in more detail about yet another difference in structures. This difference is related to the raising derivation, i.e., the derivation under which the head of the relative clause is first merged inside the relative CP in a regular argument position and then moves out. Since the noun phrase moves out of the relative clause and, as a rule, movement targets specifier positions, the final position of the head noun must be in the specifier of some functional projection; see structure (91) (see, however, Henderson (2007), Donati & Cecchetto (2011) for alternative implementations of raising).

(91) Noun in Spec,XP



In (91), the constituent that moves out of the relative clause is indicated as *head NP* and it is positioned in the specifier of some XP projection. This XP projection is the complement of the relative clause external D head that determines the distribution of the constituent. Analyses differ with respect to the identity of this XP projection: It can be a nominal functional projection (see Bhatt (2002) and Deal (2016)) or one of the extended CP projections (see Bianchi (1999, 2000b)). In the later case, the head

noun phrase is split between the main and the relative clause. This once again brings up the question on the external vs. internal position of the head noun and therefore belongs to the questions discussed in this chapter.

Furthermore, the structure under which XP is one of the CP's extended projections is sometimes adapted independently of the raising derivation (see Aoun & Li (2003) and Boef (2012)), but to derive evidence for selection between the D head and the relative CP that was accumulated after such structures were introduced to suit the needs of the raising derivation. The evidence is of two types. Arguments of the first type show that the presence of the relative clause enables the use of determiners that are ungrammatical in its absence (see Carlson (1977) and Kayne (1994)). This is illustrated in (92a-b). In both examples, the definite article cannot be used unless the noun is modified by the relative clause.

(92) a. Paris / *the Paris / the Paris *(that I love)
b. She is the kind of person *(that is always helpful). (Salzmann 2017: 51)

Given that XP is one of extended CP projections, structure (91) enables the following account of the contrast in (92): The definite article cannot be combined with certain types of noun phrases, e.g., with proper nouns in (92a), but it can always select for a CP. This CP can contain in its highest specifier a noun that happens to be a proper noun (cf. structure (93b)), so that a noun otherwise incompatible with a given determiner follows it without the noun and the corresponding determiner being directly combined with each other.

(93) a. *[$_{DP}$ the [$_{D/?}$ Paris]]
b. [$_{DP}$ the [$_{CP}$ Paris that I love]]

This view, however, does not stand up to scrutiny, because any type of modification enables the use of determiners:

(94) a. the Paris of my youth / the old Paris
b. She is the most dangerous kind of person / that kind of person / the wrong kind of person. (Salzmann 2017: 52)

Kayne (1994) takes this to be an evidence that essentially any type of modification contains a covert predication and a structure analogous to (93b). Being a welcome result under Kayne's Antisymmetry framework, this does not seem to be plausible from the perspective of current assumptions on the noun phrase syntax. In fact, the data as in (92)-(94) are subject for extensive discussions in the semantic literature: The use of the definite article with proper names illustrated in (92a) and (94a) influenced the analysis of proper names. It can receive a purely semantic account under which proper names can be individuals of type e or predicates of type ⟨e,t⟩ (see Borer (2005: 70-85), Leckie (2013), and Jeshion (2015)). The data can be accounted for

by a combination of semantic and morphological assumptions that require a null realization of the D head in certain contexts (see Matushansky (2006, 2008), and Fara (2015)). None of these accounts requires structure (91) for all nominal modification.

The second type of arguments for placement of the head noun in Spec,CP relies on a general possibility for the D head to select a relative CP directly. Evidence here comes from the internally-headed relative clauses that in some languages have an external D head as well as from intransitive determiners that can head relative clauses without a noun phrase being present. The latter is demonstrated on the basis of German in (95). In this example, an element that cannot modify an overt noun heads a relative clause showing the possibility of the [D CP] structure.

(95) Jeder/keiner, der mich kennt, hasst mich.
everyone/no.one who me know.3SG hate.3SG me
'Everyone/no one who knows me hates me.
(cf. Salzmann (2017: 53))

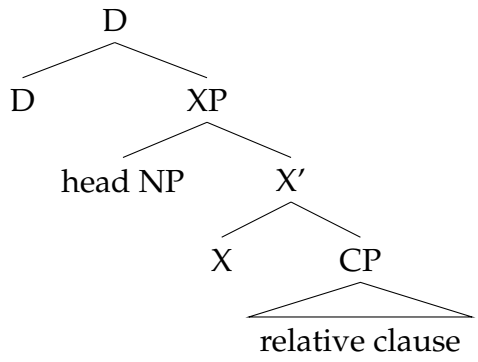
As noted by Salzmann (2014, 2017: 51-54), the data can be re-analyzed as containing a noun that does not receive a phonological realization. Moreover, even if (95) involves D-CP structure, this as well as internally-headed relatives show only the availability of the D-CP complementation. The availability of this structure per se does not argue that it is correct for relative clauses with an overt head noun.

I conclude that there is no good evidence for the relative CP being directly merged with the external D head; see Salzmann (2014, 2017: 51-54) for the same conclusion. In the next section, I will proceed talking about structure (91) and show that independently of the identity of the XP projection that hosts the head noun in its specifier, such an analysis of relatives is untenable. It leads to a situation, where the structure of the noun phrase that heads the relative clause radically differs from the noun phrase structure in virtually all other cases in that NP is not the complement of the D head, but the specifier of D's complement. I will show that such structures with the head noun in the specifier position are empirically undesirable in Moksha and cross-linguistically.

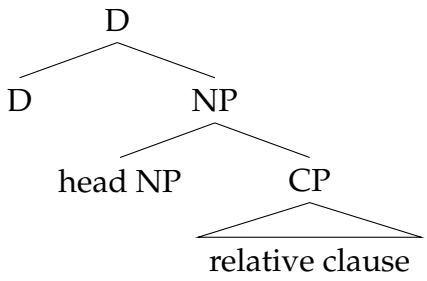
2.4.3 The structure of the head noun phrase

The main difference between (91) (repeated in (96)) and (97) lies in a structural relation between the top-most nominal projection DP and the noun itself: In (97), the projection of a noun is the complement of the D head, while in (96), XP breaks down the spine of nominal projections and the noun appears in the specifier of D's complement. I will explore processes that can be sensitive to this structural difference as well as to the presence of XP itself. I will abstract away from the possible presence of additional nominal projections such as NumP or PossP as they have no effect on the shape of the arguments.

(96) Noun in Spec,XP

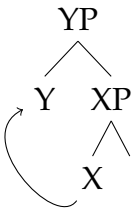


(97) NP in the complement of DP

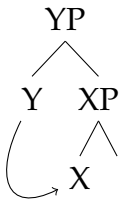


The evidence is based on two widely recognized operations that refer to the structural head-head relation: Head Movement and Lowering. The former involves upward movement of a head to a position adjoined to a head of a projection immediately dominating it (cf. Travis (1984), Baker (1988)). The latter differs in that the displacement applies downwards (see Embick & Noyer (2001)). The operations are illustrated in (98)and (99)correspondingly. Both processes can be employed in word formation, and particularly, in attachment of nominal inflection to the noun.

(98) Head movement



(99) Lowering



As mentioned in 1.2.1, nouns in Moksha are morphologically marked for definiteness. The marking is illustrated in (100a-b) for the nominative and in (101a-b) for the dative.

(100) a. kodamə bd'ə pin'ə
how INDEF dog[NOM]
'some dog'

b. t'ɛ pin'ə-s'
this dog-DEF.SG[NOM]
'this dog'

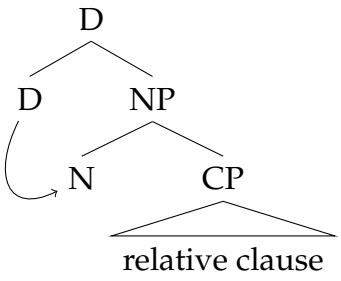
(101) a. kodamə bd'ə pin'ə-n'd'i
how INDEF dog-DAT
'to some dog'

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

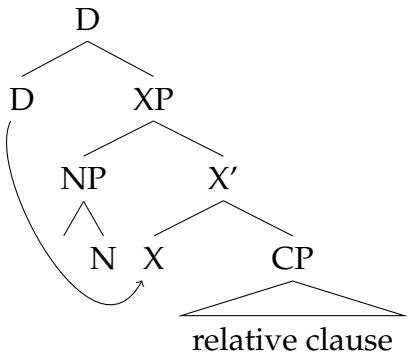
Being morphologically realized on the noun in Moksha, definiteness is widely assumed to be associated with the DP projection: The grammar then must ensure that a definiteness feature is instantiated on the D head for interpretation, but is realized on the noun. One way to ensure this is by head movement of the noun to the D head, but this does not apply to nouns in Moksha as they remain low in

the noun phrase structure. Another way to derive realization of definiteness on the noun is by Lowering of the definiteness to the N head. If heads of relative clauses have the regular noun phrase structure, D-to-N Lowering applies fully in line with the definition; see (102). Under the structure involving XP, definiteness is predicted to lower onto the X head instead of the noun (see (103)). Lowering to the N head would be illegitimate as it must target the specifier of the complement instead of the complement itself.

(102) Lowering to N



(103) *Lowering into Spec



The data in Moksha show that a noun in the head of the relative clause bears a regular definiteness inflection. Examples (104a-b) contain relative clauses with ICA and illustrate definite and indefinite marking on the head noun respectively.

(104) a. NOM ← DAT
T'ɛ pin'ə-**t'i** kona-n'd'i maks-in'ə
this dog-DEF.SG.DAT which-DAT give-PST.3.O.1SG.S
jarca-ma-t' ašči dvor-sə.
eat-NZR-DEF.SG.GEN be-NPST.3[SG] yard-IN
'This dog that I gave food is in the yard.'

b. NOM ← DAT
Kodamə bd'ə pin'ə-**n'd'i** kona-n'd'i maks-in'ə
how INDEF dog-DAT which-DAT give-PST.3.O.1SG.S
jarca-ma-t' ašči ul'ic'a-sə.
eat-NZR-DEF.SG.GEN be-NPST.3[SG] street-IN
'Some dog that I gave food is on the street.'

Thus, the structure of relative clauses that places the head noun into Spec,XP does not derive the correct inflection on the noun. The argument against it is so far based on the implementation of nominal inflection by Lowering. In what follows, I will generalize the argument and show that definiteness inflection in Moksha is not realized in the structural position occupied by the noun in (103); that is, inflection is not realized on specifiers (or other modifiers) of the main projection line.

The evidence comes from noun phrases as in (105a-b) where one noun is modified by another. Preceding the head noun, the modifying noun can be assumed to be in the specifier of some nominal projection. The modifier is thus in the same structural

position with respect to the D head as the head of the relative clause under structure (103). Nevertheless, definiteness is not realized on the modifier in (105), it is on the head of the noun phrase.

(105) a. s't'ər'-n'ɛ-n'd'i kaz'n'ə-s'
girl-DIM-DAT present-DEF.SG[NOM]
'the present for a girl'

b. Mosku-stə pojəzt-t'
Moscow-EL train-DEF.SG.GEN
'(see) the train from Moscow'

One potential difference between heads of relative clauses and modifiers in (105) is their category. A head of a relative clause is a constituent smaller than the DP (e.g., an NP), while modifiers in (105) might be full DPs. This difference is not present in (106). In this example, the modifier is a noun phrase, but not a full DP. The fact that it is a noun phrase is shown by the adjectival modifier, and the absence of higher nominal projections follows from the ban on demonstratives (see (106a)) or definiteness inflection (see (106b)).

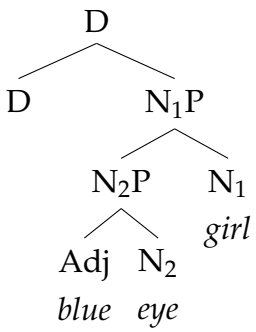
(106) Son n'ɛj-əz'ə [s'en'əm sel'mə] s't'ər'-n'ɛ-t'.
she see-PST.3SG.O.3SG.S blue eye girl-DIM-DEF.SG.GEN

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

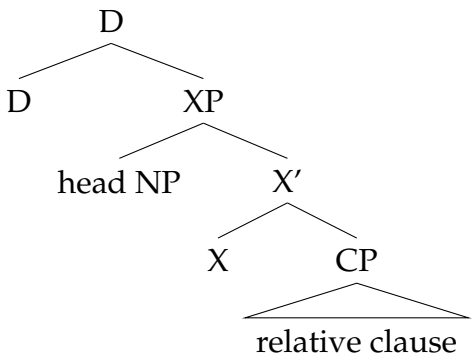
b. [s'en'əm sel'mə-(*s'/*t'n'ə)] s't'ər'-n'ɛ-t'
blue eye-DEF.SG[NOM]/DEF.PL[NOM] girl-DIM-DEF.SG.GEN
'She saw the girl with these blue eyes.'

The structure of the noun phrase in (106) is illustrated in (107). It is parallel to the structure of the head noun of the relative clause (96) (repeated in (108)) in that there is an NP modifying the projection in D's complement.

(107) NP modifier



(108) RC head in Spec,XP



In result, independently of the exact mechanism that could derive a correct inflection on relative clause heads under the structure with XP in (108) is, it inevitably predicts

that the definiteness from the D head will be realized on the modifier, not on the noun in (107) as well, because the structural configurations are identical in relevant respects. Nevertheless, example (109) shows that definiteness is not realized on the modifier, but obligatorily appears on the noun itself.

(109) 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.'

To sum up, I have argued that the structure that places the head of the relative clause in Spec,XP is problematic for the realization of the nominal definiteness inflection. First, Lowering, an operation that is commonly used for realization of inflection in languages like Moksha, by definition lowers the head to the head of its complement and thus does not derive definiteness on the head of the relative clause that is in the specifier of D's complement. Second, independently of whether some modified version of Lowering or another new operation could be then used to derive definite inflection on the head noun in the structure with XP, the mechanism would make wrong predictions about the distribution of the definiteness inflection elsewhere in the language: Inflection is then predicted to appear on the nominal modifiers instead of the noun itself.

The position of the head noun in Spec,XP is also problematic for inflection in other languages. In German, agreement inflection on nominal modifiers makes a distinction between 'strong' and 'weak' exponents and the choice between them depends on whether there is a preceding inflection-bearing determiner in the noun phrase. The contrast is illustrated in (110a-b). In (110a), the adjective is preceded by an article that realizes nominal inflection and has therefore weak exponents. In (110b), the adjective is the first modifier in the noun phrase and it shows strong inflection.

(110) a. mit dem gut-**en** Wein
with the good-WEEK wine

b. mit gut-**em** Wein
with good-STRONG wine

As shown by Heck (2005), inflection on adjectives modifying the head of the relative clause is also determined by presence or absence of the determiner; compare (111a), where the D head is realized and the adjective shows the weak inflection, and (111b), where the article is absent and the adjective shows the strong exponent.

(111) a. mit dem gut-**en** Wein, den sie gekauft hat
with the good-WEEK wine that she bought has

b. mit gut-**em** Wein, den sie gekauft hat
with good-STRONG wine that she bought has
'with good wine that she bought'

A full identity between inflection in simple noun phrases in (110) and noun phrases modified by the relative clause in (111) is puzzling if they have radically different structures. In particular, if the head noun of relative clauses is in the specifier position (as in (108)), the article that determines the shape of inflection on the following modifier is not a part of the same projection line with this modifier.

Another piece of data pointing towards the same conclusion is brought up by Pankau (2018). It comes from the so-called antiprinominal contexts in German, i.e., positions that must be occupied by full noun phrases, not by pronouns; see (112).

(112) Er kommt [**aus diesem Land**] / *aus ihm.
he comes out this country out it
'He comes/descends from that country / *from it.' (Pankau 2018: 194)

Pankau suggests that antipronominal contexts are derived by a formal requirement to fill the relevant positions by DPs with a lexical content. He further shows that heads of relative clauses in German can appear in antipronominal contexts; see (113).

(113) Er kommt [**aus einem Land**], das in der belgischen Gruppe gespielt
he comes out a country which in the Belgian group played
hat.
has
'He comes from a country that was part of the Belgian group.'
(Pankau 2018: 200)

Example (114b) further shows that the presence of a required noun phrase in the specifier of the lower projection does not satisfy the requirement.

(114) a. Ich werde [**die nächste Station**] / *sie aussteigen.
I will the next station she depart
'I will depart the next station (/*it).'

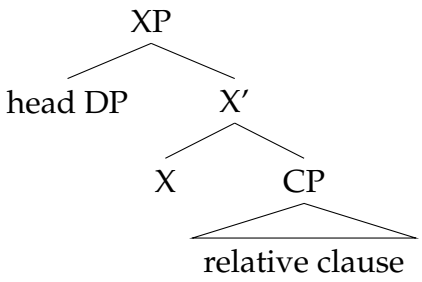
b. *Ich werde aussteigen, [[**welche Station**] du auch immer
I will depart which station you also ever
aussteigen wirst].
depart will
'I will depart whichever station you will depart.' (Pankau 2018: 216)

As a result, the fact that heads of relative clauses are grammatical in antipronominal contexts shows that head nouns are in complements of the corresponding D heads and argues against the structures that place the head noun in specifiers of

lower nominal or clausal projections.[8]

Since the problems for the relative clause structure in (108) come from the D-N relation, it seems that they might be resolved by including the D head into the noun phrase in Spec,XP as shown in (115).

(115) DP in Spec,XP



However, this structure is also problematic in various respects. The first problem is a semantic one. As shown by Partee (1975, 2015), determiners and quantifiers must scope over both the head noun and the relative CP under the restrictive interpretation. This follows if the noun and the relative CP are combined first, but is not derived if the noun is first merged with the article and only then with the relative CP.[9]

The second problem arises from the fact that XP is the topmost projection in (115), so it determines the category and the distribution of the phrase. This predicts that the distribution of a noun plus a relative clause differs from the distribution of regular noun phrases. This appears to be incorrect cross-linguistically. In Moksha, the distribution of relative clauses with ICA is obscured by their movement to the left, but as argued in section 2.3.2, their first merge positions must be the same as those of simple noun phrases.

Third, the whole noun phrase is in the specifier of X in (115) and hence does not c-command the material in the main clause, which is c-commanded by the DP under the regular noun phrase structure as well as under the structure where only NP is in Spec,XP. Example (116) shows that the head noun can bind anaphors inside the main clause. Assuming that anaphor binding requires c-command, these data argue against structure (115), where the DP is embedded into XP and there is no c-command between the DP and the anaphor.

(116) NOM ← GEN
Pet'ɛ-n'$_i$ [kona-n' tona-ft-in'ə ard-əma]
Petja-GEN which-GEN teach-PST.3.O.1SG.S drive-NZR

[8] Pankau (2018) uses the antipronominal contexts to argue for the matching derivation and against the head-external and the raising analyses. At the same time, he admits that the raising derivation can account for the attested data if the head noun moves to the argument position in the main clause and the requirement underlying the antipronominal contexts are satisfied derivationally. Nevertheless, he rejects this analysis, because there is no good trigger of the required movement of the head noun from the relative to the main clause. I will resolve this problem in chapter 4.

[9] In principle, this problem can be resolved if some departure from a full compositionality is allowed. Bach & Cooper (1978) suggest that the noun phrase itself can introduce a property variable that is then filled in by the relative CP.

mi-z'ə **es'$_i$** 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.'

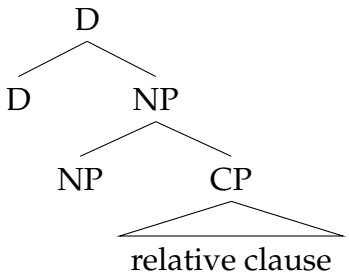
Data in (117) show that anaphor binding by the material embedded in the c-commanding projection is excluded, further supporting this argument.

(117) **Pet'ɛ-n'$_j$** jalga-c$_i$ mi-z'ə **es'$_{i/*j}$**
Petja-GEN friend-3SG.POSS.SG sell-PST.3SG.O.3SG.S self
mašinə-nc.
car-3SG.POSS.SG.GEN
'Petja$_j$'s friend$_i$ sold his$_{i/*j}$ car.'

One might suggest that the XP agrees with the DP in ϕ-features and can bind an anaphor instead of it. Such a solution seems natural if XP is a nominal projection (see Bhatt (2002), Deal (2016)). It, however, exacerbates the fourth problem: Despite the ubiquitous presence of the XP in the relative clause syntax, it is never phonologically realized. This might be because it has no features that could be targeted by Vocabulary Insertion rules, but if X agrees with the DP, consistent non-realization of the XP becomes an even bigger mystery.

I conclude that the additional XP projection in the structure of relative clauses and the placement of the head noun in Spec,XP are problematic conceptually and empirically. Combined with the main conclusion of this chapter that relative clauses with ICA are a type of externally-headed relatives, this implies that relative clauses with ICA have the structure in (118): The head noun is fully outside of the relative CP in the complement of the external D head.

(118) Relatives with ICA



2.5 Further properties: 'Attracted' case

In this section, I would like to discuss properties of relative clauses with ICA that do not contribute to this chapter's central question of classifying relatives with ICA as internally- or externally-headed, but seem to provide an important characteristic of such relative clauses. Relative clauses with ICA are peculiar in that the head of such relatives shows case assigned to a corresponding participant in the relative CP instead of a case assigned in the main clause. Following the earlier conclusion,

the head of such relative clauses is outside of the relative CP, in a regular noun phrase position in the main clause, as least at some stage of the derivation. The head noun is thus in a position in the main clause where the external case can be assigned. One might therefore expect some interaction between the internal case actually realized by the head and the external case that can be in principle assigned to the head noun according to its position. This interaction may manifest itself in restrictions on ICA that are sensitive to the respective markedness of the two cases or to the structural/inherent distinction; see Bejar & Massam (1999), Vogel (2001), Richards (2013), Himmelreich (2017), i.a., on the relevance of these parameters for the choice between two potentially available cases in other constructions.

Moksha has 15 case forms and there are thus 210 possible combinations of different internal and external cases. Checking all these possibilities remains a subject for a future research. In this section, I will illustrate some of the possible combinations and on their basis show that neither the case hierarchy nor the structural/inherent case distinction directly determines the possibility of ICA. I will suggest that a few contexts where inverse case attraction is degraded or ungrammatical arise, because a role of the head noun in the main clause cannot be retrieved in the absence of an external case marking.

I will start with the possible combinations of the nominative, genitive, and dative. The data show that if internal and external cases belong to one of them, inverse case attraction is always grammatical. Examples (119)-(121) illustrate cases where the internal case is more marked than the external one. In (119), the external case is nominative and the 'attracted' case is genitive.

(119) NOM ← GEN
Uča-**t'** [kona-n' al'ɛ-z'ə
sheep-DEF.SG.GEN which-GEN father-1SG.POSS.SG[NOM]
pečk-əz'ə] ašč-i kut-t' ingəl-ə.
butcher-PST.3SG.O.3SG.S be-NPST.3[SG] house-DEF.SG.GEN before-LOC
'The sheep that my father butchered is in front of the house.'

In (120), the head noun is marked for the dative instead of the nominative case expected according to the position of the head noun in the main clause.

(120) NOM ← DAT
Jalga-z'ə-**n'd'i** [kona-n'd'i t'aš-n'ə-n' kiz'-n'
friend-1SG.POSS.SG-DAT which-DAT write-FREQ-PST.1SG summer-GEN
per'f] kurək sa-j.
around soon come-NPST.3[SG]
'My friend to who I have been writing for the whole year is come soon.'

In (121), the external case is genitive and the head noun shows internal dative instead of it.

(121) GEN ← DAT
Jalga-z'ə-**n'd'i** [kona-n'd'i t'aš-n'ə-n' kiz'-n'
friend-1SG.POSS.SG-DAT which-DAT write-FREQ-PST.1SG summer-GEN
per'f] mon n'ɛj-sa kurək.
around I[NOM] see-NPST.3SG.O.1SG.S soon
'I will see soon my friend to who I have been writing for the whole year.'

Examples (122)-(124) illustrate configurations when the external case is more marked that the internal one. Inverse case attraction is also fully grammatical in these cases showing that the phenomenon is not governed by the case hierarchy. In (122), the head noun is marked for the nominative instead of the genitive that is expected due to the direct object position of the head noun.

(122) GEN ← NOM
Uča-**s'** [kona aščˇ-i kut-t'
sheep-DEF.SG[NOM] which[NOM] be-PST.3[SG] house-DEF.SG.GEN
ingəl-ə] mon' al'n'ɛka-z'ə l'ɛc'-əz'ə.
before-LOC I.GEN uncle-1SG.POSS.SG[NOM] shoot-PST.3SG.O.3SG.S
'My uncle shot the sheep that is in front of the house.'

Example (123) illustrates grammaticality of ICA if nominative is assigned in the relative clause and the case in the main clause is dative.

(123) DAT ← NOM
S'ora-n'ɛ-s' [kona jora-s' sa-m-s
boy-DIM-DEF.SG[NOM] which[NOM] want-PST.3[SG] come-INF-ILL
abət-tə mel'ə] mon ab'iščˇanda-n' maks-əm-s kn'iga.
lunch-DEF.SG.GEN after I promise-PST.1SG give-INF-ILL book
'I promised to give a book to a boy that wanted to comes after lunch.'

In (124), the external case is dative, but the head noun is marked for the internal genitive case.

(124) DAT ← GEN
Pin'ə-**t'** [kona-n' Pet'ɛ rama-z'ə] mon
dog-DEF.SG.GEN which-GEN Petja[NOM] buy-PST.3SG.O.3SG.S I[NOM]
maks-an jar̥ca-ma.
give-NPST.1SG eat-NZR
'I am giving food to the dog that Petja bought.'

I will now turn to the configurations where the case assigned in the main clause is more oblique, while the case assigned in the relative clause is still nominative, genitive, or dative. Data in (125) and (127) show that ICA is also possible then. In (125), dative is the case assigned in the relative CP and it appears on the head noun. The case assigned in the main clause is ablative: The head noun is the argument of the verb *pel'əms* 'to fear' in the main clause. The arguments of this verb are marked for the ablative case in Moksha. The genitive case regular for direct objects is ungrammatical for them; see (126).

(125) ABL ← DAT
Pin'ə-**t'i** [kona-n'd'i Pet'a maks'-i jaŗca-ma] mon
dog-DEF.SG.GEN which-GEN Petja[NOM] give-PST.3[SG] eat-NZR I
pel'-an.
fear-NPST.1[SG]
'I fear the dog that Petja gave food.'

(126) Mon pel'-an pin'ə-də / *pel'-in'ə pin'ə-t'.
I fear-NPST.1SG dog-ABL fear-PST.3.O.1SG.S dog-DEF.SG.GEN
'I fear the dog.'

Example (127) shows that ICA is also grammatical if the external case is inessive and the internal case is genitive. Example (128) illustrates the main clause without the relative clause to confirm that the inessive is the case expected from the noun in this example.

(127) IN ← GEN
Oš-**t'** [kona-n' mon kel'k-sa] Kat'ɛ
city-DEF.SG.GEN which-GEN I[NOM] love-NPST.3SG.O.1SG.S Katja[NOM]
er'ɛ-j.
live-NPST.3[SG]
'Katja lives in the city that I love.'

(128) Kat'ɛ er'ɛ-j oš-sə.
Katja[NOM] live-NPST.3[SG] city-IN
'Katja lives in the city.'

There are also contexts where ICA with such combination of cases is not fully acceptable under the combination of an oblique external and a direct internal case. One example is illustrated in (129). The internal case is genitive and the intended external case is inessive (cf. (130)). The example shows that the ICA is severely degraded or even impossible in this case.

(129) IN ← GEN
??*Kurtkə-**t'** [kona-n' mon rama-jn'ə]
jacket-DEF.SG.GEN which-GEN I[NOM] buy-PST.3.O.1SG.S
brad-əz'ə targa-j modamaŗ'-t'.
brother-1SG.POSS.SG[NOM] take.out-NPST.3[SG] potato-PL
'My brother is digging potatoes in the jacket I bought.'

(130) Brad-əz'ə targa-j modamaŗ'-t' sɛngɛr'ɛ
bother-1SG.POSS.SG[NOM] take.out-NPST.3[SG] potato-PL green
kurtkə-sə.
jacket-IN
'My brother is digging potatoes in a green jacket.'

I would like to suggest that the restriction on ICA arises, because native speakers cannot determine the role of the head noun in the main clause in the absence of the overt external case marking on it. Example (129) differs from examples (125) and

(127), where the combination of the oblique external and the direct internal case is grammatical, in that the head noun is neither an argument of the predicate in the main clause nor a typical adjunct. I suggest that the reduced acceptability of (129) is not a result of some clash between the external and the internal case, but is due to the absence of a semantically loaded case marker.

Let's now turn to the configurations where an oblique case is assigned in the relative CP. This encounters an independent complication: The relative pronoun *kona* 'which' has a heavily restricted inventory of case forms (see Privizentseva (2018)). It allows for the nominative, genitive, and dative case markings. Ablative case marking is also allowed, but is restricted to a few contexts. One of them is the complement of postposition *baška* 'except for'. It is illustrated in (131) for the regular externally-headed relative clause.

(131) Min' n'ɛj-əs'k s'ɛ pin'ə-t' [**kona-də baška**
we see-PST.3.O.1PL.S this dog-DEF.SG.GEN which-ABL except
aš-əl' ki-n'd'i sala-m-s sivəl'-t'].
NEG.EX-IMPF[3SG] who-DAT steal-INF-ILL meat-PL
'We noticed this dog, except for which no one would steal a meat.'

Ablative marking on the relative pronoun is ungrammatical if it fills the argument position of the verb *pel'əms* 'to fear', which requires ablative marking from its argument as shown earlier (cf. (126)).

(132) *Min' karšə vas'ft-əs'k pin'ə-t' [**kona-də**
we in.front meet-PST.3.O.1PL.S dog-DEF.SG.GEN which-ABL
pe̯l'-t'amə].
fear-NPST.1SG
'We met the dog that we fear.'

The relative pronoun in Moksha has no other case forms. For instance, example (133) shows the absence of the inessive form and example (134) of the elative form. Both examples contain regular externally-headed relative clauses.

(133) *Ručka-s' [kona-**sə** mon s'ormad-an'] ravžə.
pen-DEF.SG[NOM] which-IN I[NOM] write-NPST.1SG black
'The pen I am writing with is black.'

(134) *Mon kel'k-sa oš-t' [kona-**stə** min'
I[NOM] love-NPST.3SG.O.1SG.S city-DEF.SG.GEN which-EL we[NOM]
tu-mə].
go-NPST.1PL
'I love the city which we moved from'

Instead of the non-existing case forms, postpositional phrases are used. Example (135) illustrates a fully grammatical sentence that differs from the earlier example

[9]Some speakers marginally also allow for the comitative and the causative case marking.

(132) in that the relative pronoun marked for the ablative case is replaced by the postpositional phrase. It contains postposition *ezdə* 'in.ABL' and the relative pronoun in the genitive.

(135) Min' karšə vas'ft-əs'k pin'ə-t' [**kona-n' ezdə**
we in.front meet-PST.3.O.1PL.S dog-DEF.SG.GEN which-GEN in.ABL
pe̯l'-t'amə].
fear-NPST.1SG
'We met the dog that we fear.'

Similarly, example (136) constitutes a minimal pair with the ungrammatical example (133) and differs from it in that the relative pronoun is marked for the genitive and is the complement of the postposition *ma̯rtə* 'with'.

(136) Ručka-s' [**kona-n' ma̯rtə** mon s'ormad-an'] ravžə.
pen-DEF.SG[NOM] which-GEN with I[NOM] write-NPST.1SG black
'The pen I am writing with is black.'

Another postpostion is illustrated in (137). It replaces the elative case marking.

(137) Polka-s' [**kona-n' lank-stə** (/ *kona-stə) mešok-s'
shelf-DEF.SG[NOM] which-GEN top-EL which-EL bag-DEF.SG[NOM]
bɛc'kafc'] s'in'd'-əv-s'.
fall.PST.3[SG] break-PASS-PST.3[SG]
'The shelf from which the bag fell broke.'

Returning to relatives with ICA and our initial agenda of checking the combinations of different external and internal cases, the deficient paradigm of the relative pronoun might come across as an obstacle for checking configurations with an oblique case assigned inside the relative CP. But it turns out that the head noun and the relative pronoun can show different case markings: The head being a noun has a full case paradigm and can show an oblique case marking assigned inside the relative clause, while the relative pronoun is marked for the genitive and is part of a postpositional phrase. This is illustrated in (138). The head noun is marked for the ablative, which is assigned by the predicate in the relative CP. The ablative form is not available for the relative pronoun in this context, so it is marked for the genitive and is accompanied by the postpostion.

(138) NOM ← ABL
Pin'ə-**də** [**kona-n' ezdə** mon pel'-an aščˇ-i]
dog-ABL which-GEN in.ABL I[NOM] fear-NPST.1SG be-NPST.3[SG]
ul'c'ɛ-t' kučka-sə.
street-DEF.SG.GEN middle-IN
'The dog that I fear is standing in the middle of the street.'

The same phenomenon is shown in (139) and (140) for other case forms. In (139), the head noun shown inessive case. The relative pronoun does not have this case

form, so that the meaning is expressed by the postposition marʲtə ‘with’ and the genitive case marking on the relative pronoun.

(139) NOM ← IN
Ručka-**sə** [**kona-n'** **marʲtə** mon s'ormad-an'] ravžə.
pen-IN which-GEN with I[NOM] write-NPST.1SG black
‘The pen I am writing with is black.’

In (140), the head is marked for elative and the relative pronoun has genitive and appears to be a complement of the postposition *lank-stə* ‘top.EL’.

(140) NOM ← EL
Polka-**stə** [**kona-n'** **lank-stə** mešok-s' bɛc'kafc']
shelf-EL which-GEN top-EL which-EL bag-DEF.SG[NOM]
s'in'd'-əv-s'.
fall.PST.3[SG] break-PASS-PST.3[SG]
‘The shelf from which the bag fell broke.’

Note that the relative pronoun can be also marked for the genitive case thereby ‘attracting’ the immediate case of the relative pronoun.[10]

(141) NOM ← GEN
Pin'ə-**t'** [**kona-n'** **ezdə** mon pel'-an aščʲ-i]
dog-DEF.SG.GEN which-GEN in.ABL I[NOM] fear-NPST.1SG be-NPST.3[SG]
ul'c'ɛ-t' kučka-sə.
street-DEF.SG.GEN middle-IN
‘The dog that I fear is standing in the middle of the street.’

(142) NOM ← GEN
Ručka-**t'** [**kona-n'** **marʲtə** mon s'ormad-an'] ravžə.
pen-IN which-GEN with I[NOM] write-NPST.1SG black
‘The pen I am writing with is black.’

Inverse case attraction also shows that the absent case form is not always replaced by an overt postposition plus genitive marking. It can be also replaced by another case. In particular, direction in Moksha can be realized by illative, lative, or dative case. The relative pronoun does not have illative or lative forms, but has dative. Example (143) shows that the dative case marking on the relative pronoun can correspond to the illative case on the head.

[10] In Privizentseva (2016), I report that the indefinite genitive exponent *-n'* used on the relative pronoun in (141) and (142) is ungrammatical on the head in similar examples. The same is stated for the indefinite dative exponent in example (143). On the basis of these data, I conclude that the head and the relative pronoun get case from the predicate of the relative clause independently from each other. However, the data presented here show that the definite genitive exponent is grammatical. Thus, the ban on the indefinite exponent only shows that the morphological marker from the relative pronoun is not simply copied to the head. I suggest that the ban on indefinite exponents is due to the information-structural status of the head as well as the fact that respective indefinite markers are usually not used in the relevant contexts. In particular, the indefinite genitive marker is mainly restricted to adnominal modifiers and pronouns/proper names that do not take the definite genitive exponent. Similarly, unlike the definite dative exponent, the indefinite one is typically not used to mark direction and appears in this function only on syntactic objects with a defective paradigm (such as the relative pronoun).

(143) NOM ← ILL
Lauka-**s** [**kona-n'd'i** (/ *kona-s) tu-s' mon'
store-ILL which-DAT which-ILL go-PST.3[SG] I.GEN
brada-z'ə] af kunarə panžə-v-s'.
brother-1SG.POSS.SG[NOM] NEG long.ago open-PASS-PST.3[SG]
'Store where my brother went opened recently.'

To sum up, ICA is possible with oblique cases despite the relative pronoun lacking the corresponding case forms.

Attraction of oblique cases is subject to the restriction identified earlier: It is possible unless the role of the head noun in the main clause is unclear in the absence of the external case marking. Example (144) illustrates the internal inessive case used instead of the external dative case.

(144) DAT ← IN
Alaša-**sə** [kona-**n'** **esə** soka-tamə paks'ɛ] er'av'-i t'išə.
horse-IN which-GEN in.IN plow-NPST.1PL field need-NPST.1[SG] grass
'The horse with the help of which we plow the field needs grass.'

In (145), ICA is somewhat degraded, but not fully unacceptable. In this example, the head noun is intended to be the adjunct in the main clause.

(145) IN ← ABL
??Alaša-**də** [kona-**n'** **ezdə** mon pel'-an] er'av'-i
horse-ABL which-GEN in.ABL I[NOM] fear-NPST.1SG need-NPST.1[SG]
mol'-əm-s oš-u.
go-INF-ILL city-LAT
'We need to go to the city on the horse that I fear.'

To sum up: ICA in Moksha is in principle available with all case combinations. Case hierarchy and relative markedness of two cases do not play a role. The distinction between structural and inherent cases also does not directly determine whether ICA is grammatical. The only relevant factor is whether the role of the head noun is clear in the main clause, i.e., is recoverable in the absence of the external case marking. Cases where ICA is degraded for this reason seem to be more common with adjuncts marked for an oblique case.

In this section, I have also shown that morphological marking of the head noun does not have to be identical to the marking of the relative pronoun. The mismatch occurs in contexts where the head is marked for case that the relative pronoun lacks, so that the genitive case and a postposition are used instead.[11] The mismatch between

[11] In Privizentseva (2016), I suggest that there are mismatches in markings on the head noun and the relative pronoun that are not related to the deficient paradigm of the relative pronoun. I demonstrate that the mismatch is possible in the context of postposition *maṛtə* 'with'. A complement of this postposition can be either unmarked or marked for the genitive. However, Muravyeva & Kholodilova (2018: 216-218) have later shown that this variation is phonological and is conditioned be an initial consonant of a following word. There is thus no actual morphological or syntactic mismatch in case of the head noun and the relative pronoun in this case.

the case on the head noun and on the relative pronoun can be interpreted in various ways. First, a switch between a postposition and a case marking in Moksha might be viewed as a morphological process: The same syntactic structure can be realized as a case marker or as a postposition depending on properties of a host (cf. Caha (2009), Svenonius (2012)). On the other hand, differences in marking might show that the case is assigned to the head noun independently of the relative pronoun (see Kholodilova (2013), Privizentseva (2016)). I postpone the choice between these two options till later when we know more on the first merge position of the head noun in relatives with ICA. This will be the topic of the next chapter.

Chapter 3

Connectivity

3.1 Introduction

A peculiar property of relative clauses with ICA is the internal case marking on the head noun that occupies the position outside the relative CP according to the previous chapter's conclusion. At the first sight, the internal case suggests that despite its final relative CP external position the head originates inside the relative CP. Relatives with ICA then provide an argument for the raising analysis of relative clauses (see Bianchi (1999, 2000b) and Deal (2016)). However, it was also shown that the internal case on its own can be accounted for under the matching as well as under the head-external analyses. In particular, under the matching analysis, the external head will be deleted instead of the internal one (see Cinque (2015, 2020), Wood et al. (2017), and to some extent Abramovitz (2021)). Furthermore, under both the head-external and the matching analyses, the external head may agree with the relative pronoun in case (see Harbert (1983), Gračanin-Yuksek (2013), and also Bader & Meng (1999), Bader & Bayer (2006), and Czypionka et al. (2018)).

The goal of this chapter is to determine how internal case marking on the head noun comes about and in doing so to investigate the first-merge position and derivational path of the head noun. For that, I will apply standard connectivity diagnostics to relative clauses with ICA and to regular externally-headed relatives in Moksha. The diagnostics are based on the interpretation of idiomatic expressions, anaphor binding, variable binding, crossover effects, and condition C.

The data reveal a correspondence between a case on the head noun, on the one hand, and idiom interpretation, binding of reflexives, and condition C, on the other hand: If these diagnostics require the presence of the head noun inside the relative CP, the head is obligatorily marked for the internal case; Internal case is ungrammatical if the head noun cannot be inside the relative CP according to these diagnostics. I argue that this correlation indicates that the head of relative clauses with ICA is first merged inside the relative clause, receives its internal case there and then moves to its final position outside the relative CP. I conclude that the raising derivation is one of the available derivations for relative clauses and is thus a part of natural language

syntax. I further argue that it co-exists with yet another generation of relative clauses: the head-external analysis. It underlies relative clauses with the regular external case on the head noun. The analysis of relative clauses in Moksha supports the co-existence of two structures for relative clauses in one language (Sauerland 1998; Bhatt 2002) and provides yet another case where superficially similar phenomena have distinct analyses.

While idioms, binding of reflexives, and condition C correlate with the case marking, it turns out that pronominal binding and crossover do not show a dependency from the case marking on the head: Pronominal binding into the head noun is possible independently of the case marking, and also independently of the c-command relation between a quantified noun phrase and a relativized position inside the relative CP. Similarly, no crossover violations are attested for heads with either case marking.

I would like to suggest that this result has implications of the status of the diagnostics typically used to access syntactic structure. In particular, all of the tests employed here were recently argued to be more controversial then originally suggested. For instance, the use of the idiomatic interpretation as a test is based on the assumption that parts of an idiom must be merged as a constituent (see Bach (1974), Chomsky (1980: 149-153), and McCawley (1998: 57)). This assumption was questioned in Nunberg, Sag, & Wasow (1994) and Larson (2017); see also Webelhuth, Bargmann, & Götze (2018) for a re-analysis applied to the relative clause data. Binding of an anaphor in the head noun by the material inside the relative CP was shown to be less straightforward due to peculiarities of anaphor binding inside noun phrases (cf. the discussion in Salzmann (2017)). Binding of a variable in the head noun by the material inside the relative CP is disputed due to the possibility of quantifier raising and several cases where a quantifier binds a variable that is outside of its c-command domain (see Cecchetto (2005), Jacobson (2018), Sternefeld (2018), Barker (2018) for this discussion on relative clauses). Finally, condition C obviation that is at the core of the split between raising and matching (see Munn (1994), Sauerland (1998), Cresti (2000)) was argued to be less stable empirically in general (see Adger, Drummond, Hall, & van Urk (2017), Bruening & Al Khalaf (2019), Wierzba, Salzmann, & Georgi (2020)), as well as in relative clauses in particular (see Krifka (2018)).

A clear correspondence to the case marking attested for idioms, binding of reflexives, and condition C goes against this tendency and contributes to the body of evidence showing that these diagnostics work as originally intended and are reliable for testing a position of a syntactic object. Pronominal binding and crossover effects, on the contrary, do not seem to be determined by purely syntactic factors and, as they stand, are unreliable tests for diagnosing syntactic structure. The data on ICA in Moksha thus contribute to establishing the set of uncontroversial connectivity diagnostics for the derivational path of the head noun in relative clauses, as well as for movement dependencies more generally.

This chapter is organized as follows. I start with the background in section 3.2. I introduce the three approaches to the syntax of relative clauses (raising, matching, and head-external) and elaborate on the role ICA can play in determining a correct derivation. In section 3.3, I test connectivity diagnostics against relative clauses with ICA in Moksha. For each diagnostic, I first indicate the assumptions it is based on, review potential complications and problems, and then show how it applies to Moksha. In section 3.4, I summarize the novel data, show the analysis of relatives in Moksha, and talk about implications for the syntax of relative clauses in general.

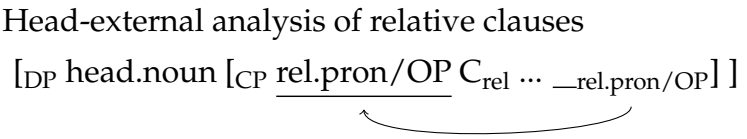
3.2 Background

3.2.1 External-head, raising, and matching

In this subsection, I will review approaches to the structure of finite relative clauses. Depending on the derivational history of the head noun, three types of analysis can be identified: head-external, raising, and matching. Analyses within each type can further differ, for instance, in the final position of the head noun, the position of the relative clause, and the way the relative clause is introduced to the structure.

Let's start with the head-external approach (see Partee (1975), Chomsky (1977), Jackendoff (1977), Platzack (2000), Boef (2012), Webelhuth et al. (2018), as well as the handbooks by Haegeman (1994) and Heim & Kratzer (1998)). A distinctive property of this approach is that the head of the relative clause is not present in the position of the relativized constituent in the relative CP. The position of the relativized element is occupied by a relative pronoun or a null operator that moves to the left periphery of the relative CP in the course of the derivation. The head noun is first merged above the relative C head. Derivation (1) illustrates a classical implementation of the head-external approach.

(1) Head-external analysis of relative clauses



Interestingly, there is an implementation of this approach under which the head noun is paradoxically merged inside the relative clause, in the higher specifier of the relative C head (see Boef (2012)). I classify this account as head-external, because the head noun is not present in the gap position as it is required by both the raising and the matching derivation.

The second type of analysis is raising (sometimes also called promotion). Its defining characteristics are that the head of the relative clause is first merged in the gap position inside the relative CP and that all further occurrences of the head noun are derived by movement (see Schachter (1973), Vergnaud (1974), Kayne (1994), Sauerland (1998, 2003), Bianchi (1999, 2000b), Zwart (2000), Bhatt (2002), De Vries

(2002), Henderson (2007), Donati & Cecchetto (2011), and Sportiche (2017)). The raising derivation is illustrated in (2). Structure (2a) shows the head noun in its base position inside the relative CP, where it builds a constituent with the relative pronoun (or with a null operator). This constituent is called the relative DP. In (2b), the relative DP moves to the left periphery. Finally, the head noun moves to the left of the relative pronoun in (2c).

(2) Raising analysis of relative clauses

a. $[_{CP}\ C_{rel}\ \ldots\ [_{DPrel}\ \text{rel.pron head.noun}\ ]\ \ldots\ ]$

b. $[_{CP}\ \underline{[_{DPrel}\ \text{rel.pron head.noun}\ ]}\ C_{rel}\ \ldots\ \_\_{DPrel}\ldots\ ]$

c. $[_{DP}\ \underline{\text{head.noun}}\ [_{CP}\ [_{DPrel}\ \text{rel.pron}\ \_\_{\text{head.noun}}\ ]\ C_{rel}\ \ldots\ \_\_{DPrel}\ \ldots\ ]$

The movement of the head noun in (2c) is the most controversial part in the analysis from the perspective of syntactic theory as well as a major source of the variation within the family of raising analyses. In the derivation above, the head noun moves out of the relative CP, but the structure does not specify the final landing site. Movement standardly targets specifier positions, so that a special functional projection is often postulated to host the movement of the head noun. This projection can be nominal and outside the relative CP (see Bhatt (2002) and Deal (2016)). It can be also clausal and the head noun then remains inside the relative CP (see Bianchi (1999, 2000b)). It was also suggested that the head does not in fact move out of the relative DP, but just moves from the complement of the relative pronoun/operator to its specifier position thereby deriving the linear precedence. In the previous chapter (2.4.2-2.4.3), I have argued that these approaches are problematic, because they give raise to an incorrect noun phrase structure, where there is no head-head relation between the head noun and the external D.

There is also a number of non-standard implementations of raising that do not require to position the head noun in a specifier. One of such approaches is developed in Donati & Cecchetto (2011), Cecchetto & Donati (2016). According to this approach, the head noun projects in its landing site and takes the relative CP as its complement. Projection is, however, possible only if the moved syntactic object is a terminal. In result, only the noun can move out of the relative clause, it cannot take any modifiers from within the relative CP. Another implementation is suggested in Henderson (2007). It employs the concept of sideward movement: The head noun phrase is first merged inside the relative clause, then moves sidewards to another tree structure and takes its place in the main clause. The relative clause is late-adjoined to it.

The third analysis is matching. It is similar to raising in that the head of the relative course is first merged inside the relative CP and builds a constituent with a relative pronoun or operator, but differs in that there is another instance of the

head noun phrase that is first-merged outside the relative CP and is not related to the internal head via movement (see Lees (1960, 1961), Chomsky (1965), Munn (1994), Sauerland (1998, 2003), Cresti (2000), Citko (2001), Salzmann (2006, 2017, 2018), Pankau (2018), and Cinque (2015, 2020)). The matching derivation is illustrated in (3). The first two steps in (3a-b) are identical to the raising derivation. In (3c), the external head is merged. The external and the internal heads match and one of them, usually the internal one, is not overtly realized.

(3) Matching analysis of relative clauses

a. $[_{CP}\ C_{rel}$ ... $[_{DPrel}$ rel.pron head.noun] ...]

b. $[_{CP}\ \underline{[_{DPrel}\ \text{rel.pron head.noun}\ ]}\ C_{rel}$ ... $\_{}_{DPrel}$...]

c. $[_{DP}$ head.noun $[_{CP}\ [_{DPrel}$ rel.pron head.noun] C_{rel} ... $\_{}_{DPrel}$ ...]

d. $[_{DP}$ head.noun $[_{CP}\ [_{DPrel}$ rel.pron ~~head.noun~~] C_{rel} ... $\_{}_{DPrel}$ ...]

While the most controversial part of the raising derivation is the movement of the noun, for the matching derivation it is the deletion of the internal head. The operation is sometimes identified as ellipsis, but differs from known cases of ellipsis in that it applies obligatorily and locally. This controversy can be resolved by recognizing that deletion of the head is not ellipsis, but a distinct operation that is attested in a very limited number of cases (cf. Bhatt (2002)).

The differences between the matching analyses also largely deal with the deletion of the head noun. For instance, Cinque (2020) suggests that it is not always the internal head that is deleted, but the external head can be deleted in some cases instead.[12] More variation deals with the interaction between the two heads at LF. Under some implementations, both heads must be interpreted (see Sauerland (1998, 2003)). According to others, although the two heads are not related by movement, they can be treated similarly to members of one chain at LF due to their identity: Munn (1994) and Citko (2001) assume that one instance of the head can be freely deleted under identity to the other. Salzmann (2018), on the other hand, suggests that one of the heads or its part can be exceptionally deleted at LF only if it is not licensed in its position.

To sum up, there are three types of the analysis for relative clauses: Under the head-external approach, the head of the relative clause is not present in a position of the relativized element; it is first merged above the relative C head. Under the raising approach, the head is merged in the position of the relativized constituent and all further occurrences of the head are derived by movement. Under the matching approach, the head noun is first merged in the position of the relativized constituent, but the structure also includes an instance of the head that is not related by movement.

[12] For this reason, Cinque calls this derivation raising, but since the structure includes two occurrences of the head noun that are not related by movement, I will identify it as a version of matching here.

The syntax of relativization is often not confined to one of the three approaches. Instead, it is sometimes suggested that several derivations can co-exist in grammar. For instance, Sauerland (1998, 2003) proposes that both raising and matching must be available to account for diverse properties of relative clauses. This idea is further supported by Bhatt (2002), who argues that the inability to account for some phenomenon is not an argument against an analysis in general, but only shows that another derivation underlies relative clauses with a given property.

There are also attempts to show that one derivation is sufficient to account for all attested properties of relative clauses. Donati & Cecchetto (2011) and Sportiche (2017) argue that the sole available derivation is raising, while Salzmann (2017, 2018) and Cinque (2020) claim that it is matching. In both cases, the unified account of relativization comes at costs of radically complicating the analysis and allowing for variation within one derivation type. For raising, Sportiche (2017) suggests that the final landing site of the head can be lower (in the relative CP) or higher (outside the relative CP) and this imitates the effects of raising and matching. For matching, the internal or the external head can be deleted.

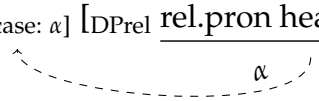
3.2.2 The role of ICA

The phenomenon of ICA was argued to provide a decisive argument in favor of the raising analysis: The head noun shows the case assigned in the relative CP and hence it must have been in a position where this case is assigned; i.e., inside the relative CP (see Bianchi (1999, 2000b) and Deal (2016)). This evidence for the raising derivation is important, because it is morphological, and differs from nearly all existing arguments for the relative CP internal origin of the head noun that are based on interpretative semantic effects.[13]

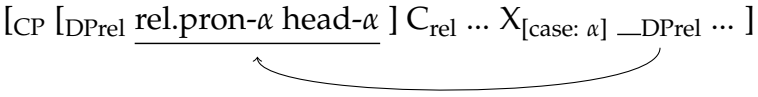
Derivation (4) shows how ICA is analyzed under raising. In (4a), the head is merged inside the relative CP and receives its case there. The second step in (4b) shows the movement of the relative DP to Spec,CP. The third step in (4c) presents the movement of the head noun out of the relative CP.

(4) Inverse case attraction derived by raising

a. Case assignment in the relative CP:

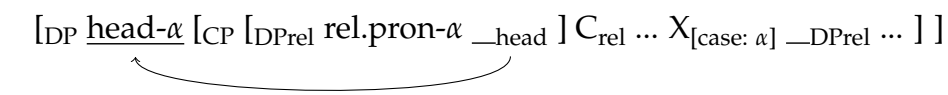


b. Movement of the relative DP:



[13] Pankau (2018) suggests that antipronominal contexts provide another argument that is not based on interpretative effects.

c. Movement of the head:



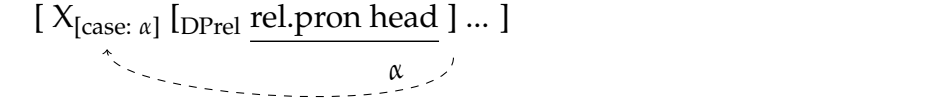
The internal case marking on the head noun is a direct consequence of raising. Moreover, additional assumptions are required to exclude the internal case on the head noun and derive marking by a case assigned in the main clause. As the external case marking is widely attested, while ICA is a rather rare phenomenon, Borsley (1997) lists additional assumptions needed to derive the external case marking as one of the problems of raising.

The possibility to derive ICA by raising is by itself insufficient to provide a full-fledged argument for this derivation. It has to be also shown that the other two derivations – matching and head-external – cannot account for inverse case attraction. However, it turns out that they can.

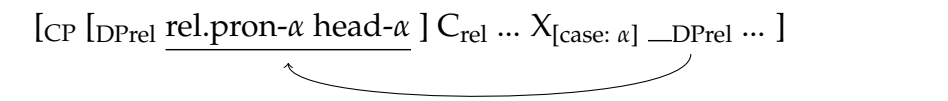
Cinque (2015, 2020) and Wood et al. (2017) (to some extent also Abramovitz (2021)) claim that relatives with ICA are derived by matching and it is the internal instance of the head that is realized instead of the external one. The derivation is illustrated in (5). The first two steps in (5a-b) are fully identical to the raising derivation: The head noun is merged inside the relative CP, receives case there, and moves to the left periphery together with the relative pronoun. The third step is illustrated in (5c). It differs from the implementation of the raising derivation in (4) in that the head noun remains inside the relative CP, but is similar to other implementations of raising in this respect (cf. Kayne (1994) or Bianchi (1999, 2000b)). After this, the external instance of the head noun is merged in (5d). The final step in (5e) illustrates the deletion of the external head noun. This step might apply significantly later in the derivation, at PF. In result, the instance of the head noun with the internal case is overtly realized.

(5) Inverse case attraction derived by deletion of external head under matching

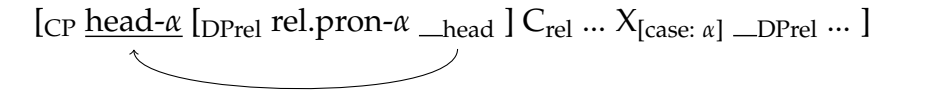
a. Case assignment in relative CP:



b. Movement of the relative DP:



c. Movement of the internal head:



d. Merge of the external head:

[DP head [CP head-α [DPrel rel.pron-α _head] Crel ... X[case: α] _DPrel ...]]

e. Deletion of the external head:

[$_{DP}$ ~~head-β~~ [$_{CP}$ head-α [$_{DPrel}$ rel.pron-α __$_{head}$] C_{rel} ... $X_{[case:\ \alpha]}$ __$_{DPrel}$ ...]]

Yet another account of ICA was developed by Harbert (1983) and Gračanin-Yuksek (2013) (see also Bader & Meng (1999), Bader & Bayer (2006), Czypionka et al. (2018)). They propose that the head noun receives its case via agreement with the relative pronoun. This analysis is fully compatible with both the matching and the head-external approaches, so that ICA does not provide any insight into the syntax of relativization under this view. Instead, the analysis makes further assumptions on Agree: Probes must be able to serve as goals for further Agree after they are valued (cf. a concept of Cyclic Agree by Legate (2005)). The derivation of ICA by agreement is illustrated in (6). The relative pronoun gets case inside the relative CP in (6a), then moves to Spec,CP in (6b). After this, the external head is merged. It has an unvalued case feature. This feature finds the closest suitable goal and it is the case feature on the relative pronoun; see (6d). The head noun gets the internal case without being present inside the relative clause at any step of the derivation.

(6) Inverse case attraction derived by agreement

a. Case assignment in relative CP:
[$X_{[case:\ \alpha]}$ rel.pron ...]
(α)

b. Movement of the relative pronoun to Spec,CP:
[$_{CP}$ rel.pron-α C_{rel} ... $X_{[case:\ \alpha]}$ __$_{rel.pron}$ ...]

c. Merge of the external head:
[$_{DP}$ head [$_{CP}$ rel.pron-α C_{rel} ... $X_{[case:\ \alpha]}$ __$_{rel.pron}$ ...]]

d. Agreement between the head noun and the relative pronoun:
[$_{DP}$ head [$_{CP}$ rel.pron-α C_{rel} ... $X_{[case:\ \alpha]}$ __$_{rel.pron}$ ...]]
(α)

To sum up: In this section, I have reviewed three existing accounts of ICA and shown that the phenomenon by itself is insufficient to make any conclusions on the correct analysis of relative clauses. In the next section, I will apply standard connectivity diagnostics to relatives with ICA in Moksha and to regular externally-headed relatives. On the basis of this novel data, I will argue that relative clauses with ICA must be indeed analyzed by raising, while the latter re-analyses are incorrect. The combination of ICA and connectivity effects provides a clear argument for the raising analysis of relative clauses.

3.3 Connectivity in relative clauses with ICA

The term connectivity effects refers to a set of phenomena that are meant to diagnose presence or absence of a syntactic object in a certain position. These diagnostics are based on processes for which it is independently argued that they can apply only if some structural conditions are met. These conditions are met (or correspondingly violated) only if the object of interest is present in a given position or only if it is absent from this position. Connectivity effects are standardly used to diagnose the first merge position of moved syntactic objects. They can be applied to relative clauses to determine whether the head noun is present in the gap inside the relative clause.

Connectivity effects are often called reconstruction effects in existing literature. I refrain from using the term *reconstruction*, because even though it is sometimes used as theory-neutral, it presupposes an analysis under which a syntactic object vacates its base position, but is later reconstructed there, i.e., moves back (see May (1977)). Current approaches to connectivity do not rely on the actual reconstruction procedure: Syntactic approaches to reconstruction make use of the Copy Theory of movement (see Chomsky (1993, 1995b)), so that there is a copy of the moved syntactic object that remains in its base position and connectivity can be derived by simply interpreting the lower copy instead of the higher one (see Sauerland (1998), Fox (1999), but also Kang & Müller (1996) against this approach). Semantic approaches to reconstruction often rely on traces of higher types that allow a syntactic object to be interpreted as if it were in a lower position (see Cresti (1995), Rullman (1995) among others), but also do not require its actual reconstruction into the original position.

In what follows, I will look at the standard connectivity diagnostics – idioms, anaphor binding, variable binding, crossover effects, and condition C – in Moksha relative clauses with ICA as well as in regular externally-headed relatives. I will start the discussion of each diagnostic with the assumptions that it relies on and existing results of its application to relative clauses. I will also indicate empirical and theoretical problems of the diagnostics used here.

3.3.1 Idioms

Overview

The first diagnostic is based on idiomatic expressions. It is widely assumed that parts of an idiom must be base generated as a constituent (see 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 must shed light on the derivational path of the head noun.

Let's start with cases where the head noun is part of an idiom in the relative clause. This was shown to be possible in English as well as in other languages. Consider

English data in (7). Example (7a) shows idiomatic expression *to keep track of* in a simple sentence. Next, example (7b) contains the relative clause where the head noun is part of the same idiom as the predicate of the relative clause. Idiomatic interpretation is claimed to be grammatical here. Finally, example (7c) completes the paradigm and shows that the main clause as in (7b) is ungrammatical on its own, presumably because it contains only a part of the idiom.

(7) a. She's **keeping** careful **track** of her expenses.
b. The careful **track** [that she's **keeping** of her expenses] pleases me.
c. *The/Ø careful track pleases me. (Schachter 1973: 32)

Interpretation of idioms and the data as in (7) were at origin of the raising analysis (see Brame (1968), Schachter (1973), and Vergnaud (1974)). Under this analysis, the head of the relative clause is first merged inside the relative CP and then moves to a higher position, so that the requirement that all parts of an idiomatic expression must be base generated together is fulfilled; cf. (8).

(8) a. $[_{CP}$ ... is keeping track of ...]
b. $[_{DP}$ track $[_{CP}$ ... is keeping $\_\__{track}$ of ...]]

Whether the data can be derived under the matching analysis depends on its specific implementation. For instance, Sauerland (1998) (see also Bhatt (2002)) assumes that both instances of the head noun must be interpreted at LF. Since the external instance of the head also contains a part of an idiom, but was not merged in the relative CP together with the rest of the idiom, it remains unlicensed and the sentence is predicted to be ungrammatical, contrary to the facts. Salzmann (2018) (see also Munn (1994) and Citko (2001)), on the other hand, develop a version of matching under which one instance of the head can be deleted at LF due to the identity between the two heads. It is then expected that the internal head is interpreted and gives rise to an idiomatic interpretation, while the external head is deleted at LF. However, it is not obvious whether this analysis is still compatible with the condition that parts of an idiom must be merged together: Deletion at LF can apply because of the semantic identity between the two heads, but their meaning cannot be identical if one of them has an idiomatic interpretation, while the other one has its literal meaning. I will return to this question shortly.

The head-external analysis cannot account for idioms in the relative clause: The head was never in the relative clause and hence the requirement that all parts of an idiom are base merged together is not met.

Let's now turn to cases where the head noun builds an idiom with a main clause material. Under the assumption that parts of an idiom must be base generated together, idioms in the main clause clause would be straightforwardly derived under

the head-external analysis as well as under the version of the matching derivation that allows to delete the second instance of the head noun (the internal one in this case). Implementations of matching that require both heads to be present at LF as well as raising analysis exclude idioms in the main clause, because the head noun is merged inside the relative CP, away from the rest of an idiom.

The empirical picture is less clear for idioms in the main clause. For instance, Vergnaud (1974) (see also Donati & Cecchetto (2011)) claims that the head noun cannot form an idiom in the main clause in French; see (9a). This example shows that idiom *prendre part* 'to take part' is ungrammatical in the main clause. Example (9b) shows that the idiomatic interpretation is grammatical if the same idiom is split between the head noun and the material inside the relative CP.

(9) a. *Il a **pris** aux travaux du 9ème congrès la **part** [qu'il
he has taken in.the workings of.the 9th conference the part that.he
décrit dans son livre].
describes in his book
'He took a part in the 9th conference that he describes in his book.'

b. Il décrit dans son livre la **part** [qu'il a **prise** aux travaux
he describes in his book the part that.he has taken at.the workings
du 9ème congrès].
of.the 9th conference
'He describes in his book the part that he took in the 9th conference.'
(Donati & Cecchetto 2011: 524-525 adopted from Vergnaud 1974: 58-59)

A different empirical picture was reported for English. McCawley (1981) (later also Bhatt (2002), Salzmann (2018)) observes that in English the head of the relative clause can form an idiom not only with a material in the relative CP, but also with the main clause. This is shown in (10).

(10) a. Parky **pulled the strings** [that got me my job]. (McCawley 1981: 137)
b. We **made headway** [that was sufficient]. (Bhatt 2002: 47)

To sum up, idioms in the relative CP can be accounted by the raising analysis and by the version of the matching analysis that allows to delete one of the heads. The data on idioms in the main clause are controversial: Ban on idioms in the main clause in French is predicted by raising and matching with obligatory interpretation of both heads, while grammaticality of idioms in the main clause in English is expected under the head-external analysis and the version of the matching with LF deletion of one of the heads. In result, this implementation of the matching derivation is the most permissive approach in that it allows for idioms in the relative and in the main CP. Recall, however, that this approach is not obviously compliant with our key assumption that parts of an idiom must be base generated together: The approach requires to delete one of the head nouns and assumes that the deletion is enabled by identity between the two heads, but the two heads arguably cannot be identical if

one of them is part of an idiom and the other one has its literal meaning. Thus, the analysis requires either to weaken conditions on identity between the heads or to weaken conditions on idiomatic interpretation, so that the instance of the head noun that is merged separately from the idiom could have an idiomatic meaning as well.

If conditions on idiomatic interpretation are weakened, other analyses become more permissive as well. For instance, Sportiche (2017) shows that raising can account for idioms in the main clause if parts of an idiom do not have to be base generated together, but is sufficient if they build a constituent at some point of the derivation and thereby can be interpreted together at LF. As the head noun moves to the main clause, this condition is fulfilled under the raising analysis.

Further weakening of conditions on idiomatic interpretation also allows the head-external analysis to account for idioms in the relative CP. A starting point for this revision is the distinction between the more transparent and more opaque idiomatic expressions. It was proposed that the constituency requirement does not hold for more transparent idioms and they therefore do not shed light on the syntactic structure (see Nunberg et al. (1994), Larson (2017)). Opaque idioms still have to build a constituent, but they are also often frozen syntactically and cannot be split between the head and a material inside the relative CP (see McCawley (1981) and De Vries (2002)). This is shown in (11), where idiomatic expression *to kick the bucket* 'to die' cannot be split between the head and the predicate in the relative CP. This idiom is considered to be opaque, because a literal meaning of none of its parts contributes to its idiomatic interpretation.

(11) *The **bucket** [he **kicked**] was horrible. (De Vries 2002: 78)

Webelhuth et al. (2018) propose that idioms do not provide a good diagnostic tool for the original position of the head noun, because only more transparent idioms are used in relative clauses, and they do not require constituency, but only a presence of all parts of an idiom in a broader context. This view is by far not uncontroversial as well: For instance, Bruening (2020) most recently shows that idiomatic expressions independently of the degree of their idiomaticity are subject to the same syntactic constraints and argues that this can be best accounted for if all idioms are generated as a constituent.

Data

I will now apply this diagnostic to relative clauses with ICA and to regular externally-headed relative clauses in Moksha. I will do so on the basis of two idiomatic expressions. The first one is *pan'žəms potmə*. Its direct translation is 'to open guts/insides' and idiomatic meaning is 'to open up / to tell everything'. Example (12) illustrates this idiom in a simple sentence.

(12) Vas'ɛ pan'ž-əz'ə potmə-nc ava-ncti.
Vasja[NOM] open-PST.3SG.O.3SG.S gut-3SG.POSS.SG.GEN wife-DEF.SG.DAT
'Vasja told everything to his wife.'

The second idiomatic expression is *s'ed'ijəc af ozaj*. Its literal translation is 'someone's heart does not sit' and it means that the person is worried. Example (13) shows this idiom in a simple sentence.

(13) S'ed'i-c'ə af oza-j.
heart-2SG.POSS.SG[NOM] NEG sit-NPST.3[SG]
'You are worried.'

In what follows, I will show that the first idiom *pan'žəms potmə* 'to open up / to tell everything' demonstrates a correlation between the case of the head noun and the idiomatic interpretation. The second idiom *s'ed'ijəc af ozaj* 'to worry' gives a less clear empirical picture: Some speakers show the same correlation as with the other idiom, while others use it irrespective of the case on the head noun.

Let's start with cases where an idiom is split between the head noun and the material inside the relative CP. Examples (14) and (15) use the idiom *pan'žəms potmə*. The relative clause in (14) has ICA, so that the head noun is marked for the case assigned in the relative CP. The idiom is grammatical in this sentence.

(14) NOM ← GEN
Potmə-nc [kona-n' Vas'ɛ **pan'ž-əz'ə**
gut-3SG.POSS.SG.GEN which-GEN Vasja[NOM] 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 told to his wife was worrying him for a long time.'

Example (15) differs in the case marking on the head noun. The head noun shows external case and this leads to ungrammaticality.

(15) ***Potmə-c** [kona-n' Vas'ɛ **pan'ž-əz'ə**
gut-3SG.POSS.SG[NOM] which-GEN Vasja[NOM] 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 told to his wife was worrying him for a long time.'

Thus, we see that the head noun can build an idiom with the relative clause internal material only if the head noun has an internal case. The second idiom *s'ed'ijəc af ozaj* also can be split between the head noun and the relative CP if the head is marked for the internal case; see (16).

(16) GEN ← NOM
S'ed'i-c'ə [kona **af** **oza-j**]
heart-2SG.POSS.SG[NOM] which[NOM] NEG sit-NPST.3[SG]
van-ft-k.
see-CAUS-IMP.3SG.O.3SG.S

'Take care of your heart that does not calm down.'

In (17), the head noun shows the external genitive case. This sentence is judged as ungrammatical by some speakers, but allowed by the others. Thus, some of the speakers replicate the dependency between the case and the idiom in the relative CP observed for the first idiom, while others allow to use this second idiom independently of a case marking on the head noun.

(17) %**S'ed'i-c'ə-n'** [kona **af oza-j**]
heart-2SG.POSS.SG-GEN which[NOM] NEG sit-NPST.3[SG]
van-ft-k.
see-CAUS-IMP.3SG.O.3SG.S
'Take care of your heart that does not calm down.'

I will now turn to cases where the head noun forms an idiom with the material in the main clause. The first idiom *pan'žəms potmə* again shows the correlation with the case of the head noun. Example (18) illustrates that the idiom in the main clause is grammatical if the head noun shows case assigned in the main clause.

(18) **Potmə-nc** [kona kunarə af maks-i pokoj]
gut-3SG.POSS.SG.GEN which[NOM] long.ago NEG give-PST.3[SG] rest
Vas'ɛ **pan'ž'-əz'ə** ava-ncti
Vasja open-PST.3SG.O.3SG.S wife-DEF.SG.DAT
'Vasja opened his wife the secret that was worrying him for a long time.'

ICA is incompatible with the idiom in the main clause. In (19), the head noun is marked for the internal nominative case and the idiom leads to ungrammaticality.

(19) GEN ← NOM
*__Potmə-c__ [kona kunarə af maks-i pokoj]
gut-3SG.POSS.SG[NOM] which[NOM] long.ago neg give-PST.3[SG] rest
Vas'ɛ **pan'ž'-əz'ə** ava-ncti
Vasja open-PST.3SG.O.3SG.S wife-DEF.SG.DAT
'Vasja opened his wife the secret that was worrying him for a long time.'

The idiom *s'ed'ijəc af ozaj* in the main clause is grammatical if the head noun is marked for the external case.

(20) **S'ed'ij-əc** [kona-n' Paša pɛk
heart-3SG.POSS.SG[NOM] which-GEN PashaNOM very
van-fci] **af oza-j**.
see-CAUS.NPST.3SG.O.3SG.S NEG sit-NPST.3[SG]
'His heart that Pasha takes care of is not calm.'

If the head noun is marked for internal case, some speakers still judge the sentence as grammatical, while others do not allow it.

(21) NOM ← GEN

%**S'ed'ij-ənc** [kona-n' Paša pɛk
heart-3SG.POSS.SG.GEN which-GEN Pasha[NOM] very
van-fci] **af oza-j**.
see-CAUS.NPST.3SG.O.3SG.S NEG sit-NPST.3[SG]
'His heart that Pasha takes care of is not calm.'

To sum up: First, there is some variation among native speakers with respect to the behavior of the idiom *s'ed'ijəc af ozaj* 'to worry'. For some speakers, it shows the same correlation between case and grammaticality as the idiom *pan'žəms potmə* 'to open up/ to tell everything'. For others, it is grammatical independently of the case marking. I assume that idioms do not constitute a homogeneous class for the latter group of speakers and differ in what is required for the idiomatic interpretation to be possible. Second, abstracting away from speakers who do not show the correlation for one of the idioms, we see the correlation between the possibility of the idiomatic interpretation and the case marking on the head noun: Idioms inside the relative CP are grammatical only if the head noun shows an internal case; idioms in the main clause are possible only if the head noun has an external case.

I suggest that the attested correspondence between connectivity and case on the head noun is expected if relative clauses with ICA (i.e., with the internal case) are derived by raising, while regular externally-headed relative clauses (i.e., relative clauses with the external case) are derived by head-external generation.

The data on idioms also have implications for the analysis of idioms: The dependency between case and idioms can be derived only if the strongest assumptions hold at least for some syntactically flexible idioms; that is, if parts of an idiom must enter the derivation together (see Bach (1974), Chomsky (1980: 149-153), McCawley (1998: 57), and Bruening (2020)).

3.3.2 Anaphor binding

Overview

The second connectivity effect is based on anaphor binding (see Schachter (1973), Kayne (1994), Bianchi (1999), De Vries (2002), Bhatt (2002), Salzmann (2017: 66-71), i.a.). According to the Condition A of the standard Binding Theory, anaphors (reflexives and reciprocals) must be bound by a local c-commanding syntactic object (see Chomsky (1981, 1986)). This is illustrated in (22). Antecedents c-command anaphors in (22a-b), but not in (22c-d). The antecedent is too deeply embedded into the subject in (22c) and no syntactic element c-commands the anaphor in (22d). There is a c-command relation in (22e), but the antecedent is outside of anaphor's local biding domain.

(22) a. John$_i$ hates himself$_i$.
b. The men$_i$ admired each other$_i$.
c. *John$_i$'s mother hates himself$_i$.

d. *Each other$_i$ admire the men$_i$.
e. *John$_i$ said that Mary hates himself$_i$.

The requirement for the local c-commanding antecedent makes anaphor binding a good diagnostic tool for the base position of the head noun. The test is schematized in (23): The head of the relative clause contains an anaphor, while the intended antecedent is inside the relative CP, where it c-commands the relativized position. If the anaphor in the head noun phrase can be bound by this antecedent inside the relative CP, the head must have been in the relativized position earlier in the derivation.

(23) [$_{DP}$ head.noun+anaphor$_i$ [$_{CP}$ ... antecedent$_i$ ... __$_{relativized.position}$]]

Binding of the anaphor in the head of the relative clause is indeed possible; see (24) from English.

(24) a. The portrait of **himself$_i$** [that **John$_i$** painted] is extremely flattering.
b. The interest in **each other$_i$** [that **John and Mary**$_i$ showed] was fleeting. (Schachter 1973: 32-33)

Such data are straightforwardly accounted for under the raising derivation: The head is first merged inside the relative CP and the anaphor it contains can be bound in this position. The matching analysis postulates a representation of the head in the relativized position, but differs in that another instance of the head is base generated outside the relative CP and contains an anaphor that cannot be bound. This leads to a crash under the implementation of matching where both heads must be interpreted at LF (see Sauerland (1998)), while an unlicensed anaphor can be simply deleted under the implementation that allows such a deletion (see Salzmann (2017)).

Before applying anaphor binding to relative clauses in Moksha, several problems of this diagnostic must be addressed. One of the problems comes from a peculiar behavior of anaphors in noun phrases, the so-called exempt anaphors. In particular, it was shown for English, that the anaphor in a noun phrase can be grammatical despite an absence of a local binder; see Pollard & Sag (1992) and Reinhart & Reuland (1993). Example (25a) shows that the anaphor in the noun phrase can refer to the noun outside of its local binding domain. This contrasts with example (25b), where an anaphor is an argument of the verb and it cannot have such a reference.

(25) a. Bush and Dukakis$_i$ charged that general Noriega had secretly contributed to each other$_i$'s campaigns.
b. *Bush and Dukakis$_i$ charged that General Noriega has secretly visited each other$_i$. (Pollard & Sag 1992: 267)

Moreover, anaphors in the noun phrase are sometimes grammatical without any c-commanding binder; see (26), where the reflexive refers to *John* from the previous

sentence.

(26) John$_i$ was furious. The picture of himself$_i$ in the museum has been mutilated. (Pollard & Sag 1992: 268)

If anaphors in noun phrases are not subject to the c-command requirement as these data suggest, then the binding of an anaphor in the head of the relative clause no longer provides an evidence for the relative CP internal position of the head noun. There have been several attempts to account of exceptional binding in noun phrases without rejecting the c-command requirement. For instance, it was suggested (see Chomsky (1986), i.a.) that the subject position in the noun phrase can be occupied by PRO that c-commands the anaphor and locally binds it; see (27).

(27) [PRO$_i$ the picture of himself$_i$]

While Pollard & Sag (1992) have argued that this solution does not cover all instances of the exempt anaphora, the idea of a null PRO in the external argument of the noun phrase received some support from the research on nominal syntax (see Abney (1987) and Giorgi & Longobardi (1991)). Applied to relative clauses, this means that it is PRO, not the intended antecedent in the relative CP that binds an anaphor in the head noun.[14]

Bianchi (1999), De Vries (2002), Cecchetto (2005), and Salzmann (2017) show that the complication is circumvented if the head noun has no external argument, if the anaphor is embedded into the external argument, or if the interpretation under which the anaphor refers to the external argument is semantically implausible. For instance, in (28) from Italian, the anaphor is embedded in the single argument of the noun. In (29) from Dutch, binding of the anaphor by PRO is excluded due to the expected interpretation: The binder must be the hearer, not the story-teller.

(28) L'unica vonseguenza della **propria$_i$** decisione [che **Gianni$_i$** non aveva
only consequence of.the own decision that Gianni not had
considerato] si riveló disastrosa.
considered turned.out disastrous
'The only consequence of his decision that Gianni had not taken into consideration turned out to be disastrous.' (Bianchi 1999: 119)

(29) De PRO$_j$ verhalen over **zichzelf$_i$**, [die **Paul$_i$** hoorde], waren pure
the stories about self which Paul heard were mere
leugens.
lies
'The stories about himself that Paul heard were mere lies.' (De Vries 2002: 80)

This resolves the problem posed by PRO in the external argument slot, but not the

[14] Another way to rescue this diagnostic is to argue that the presence of the head noun inside the relative clause is required for binding of PRO that then in turn binds the anaphor, but this option is not pursued in existing work.

arguably bigger problem of exempt anaphors; see Charnavel & Sportiche (2016), Charnavel (2019), Charnavel & Bryant (2022) for a recent discussion. Indeed, the existing evidence for the relative clause internal origin of the head noun that is based on the anaphor binding does not take this issue seriously and might turn out to be significantly less convincing once exempt anaphors are added to the picture. However, one language for which the possibility of exempt anaphora is considered is Italian. Bianchi (1999: 115-119) claims that the regular anaphoric pronoun does not allow for logophoric readings and pronouns that have logophoric readings are morphologically different. Further evidence that addresses the problem of exempt readings is presented in (30)-(31). These sentences build a minimal pair and differ by the position of the anaphor. In (30), the anaphor is in the head noun and it is bound by the subject of the relative clause. In (31), the anaphor is in the main clause, but not in the head of the relative clause. The sentence is ungrammatical showing that the exempt reading is excluded.[15]

(30) ?Questi sono i contributu al **proprio$_i$** volume [dei quali **Gianni$_i$**
there are the contributions to.the own volume with which Gianni
é soddisfatto].
is satisfied
'These are the contributions to his volume that Gianni is satisfied with.'

(31) *Questi é il **proprio$_i$** constibuto al volume [di cui **Gianni$_i$** é il
this is the own contribution to.the volume of which Gianni is the
curatore].
editor
Intended: 'This is his own$_i$ contribution to the volume of which Gianni$_i$ is the editor.' (Bianchi 1999: 117)

Data

Moksha has several ways of expressing reflexivity (see Toldova & Shalganova (2018) for a recent description). Most of them include reflexive element *es'* 'self' and/or grammaticalized noun *pr'ɛ* 'head'. For instance, a widely attested composite reflexive *es' pr'ɛ* is illustrated (32). In this example, the subject binds the reflexive in the direct object position.

(32) Vas'ɛ$_j$ [es' pr'a-nc]$_{j/*i}$ arala-si
Vasja[NOM] self head-3SG.POSS.SG.GEN protect-NPST.3SG.O.3SG.S
lomat'-t'n'ə-n' ezdə.
human-DEF.PL-GEN in.ABL
'Vasja protects himself from these people.' (Toldova & Shalganova 2018: 636)

In the adnominal position, simple reflexive *es'* is used. This is shown in (33). As in the previous example, the reflexive is obligatorily bound by the c-commanding noun

[15] De Vries (2002: 80-82) makes the same claim for Dutch: He suggests that anaphor *zichzelf* does not allow for exempt readings and shows that it can be bound inside the relative clause.

phrase here.

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

A noun modified by *es'* has a possessive marker. The possessive marking can be used without the reflexive, but the reference is then not restricted to the c-commanding antecedent; see (34).

(34) Van'ɛ$_{i}$ var'aga-nc$_{i/j}$ mu-z'ə.
Vanja[NOM] mitten-3SG.POSS.SG.GEN find-PST.3SG.O.SG.S
{Context: Petja lost his mitten.} 'Vanja$_{i}$ found his$_{i/j}$ mitten.' (Toldova & Shalganova 2018: 654)

When present, *es'* seems to occupy the possessor position, so that the possessive marking results from agreement with it. This is further supported by the fact that possessive inflection realizes ϕ-features of the noun phrase that binds the reflexive; see (35), where the first person singular pronoun is the antecedent of the anaphor and the possessive marker also expresses first person singular features.

(35) Mon$_{i}$ tu-šənd-an es'$_{i}$ vel'ə-zə-n.
I[NOM] goFREQ-NPST.1SG self village-ILL-1SG.POSS.SG.GEN
'I am going to my village'. (Toldova & Shalganova 2018: 654)

Since unlike in English and some other European languages, the reflexive pronoun in Moksha can be directly in the possessor / external argument position, the problem of the silent PRO in this position does not arise.

Turning now to the binding of reflexives in relative clauses, we see that the anaphor in the head noun can be bound inside the relative CP if the head has internal case:

(36) NOM ← GEN
Es'$_{i}$ kud-**ənc** [kona-n' **Vas'ɛ$_{i}$** mi-z'ə]
self house-3SG.POSS.SG.GEN which-GEN Vasja[NOM] sell-PST.3SG.O.3SG.S
t'ɛn'i ašč-i savə
now be-PST.3[SG] empty
'His$_{i}$ house that Vasja$_{i}$ sold is now empty.'

If the head noun shows external case, the reflexive cannot be bound inside the relative CP; see (37).

(37) *__Es'$_{i}$__ kud-**əc** [kona-n' **Vas'ɛ$_{i}$**
self house-3SG.POSS.SG[NOM] which-GEN Vasja[NOM]
mi-z'ə] t'ɛn'i ašč-i savə.
sell-PST.3SG.O.3SG.S now be-PST.3[SG] empty

Intended: 'His house that Vasja sold is now empty.'

Thus, analogous to the data from the previous section, we see a dependency between the case on the head noun and connectivity – anaphor binding, here. This dependency seems to be sufficient to diagnose the base position of the head noun, but I would like to strengthen the argument by excluding the possibility of binding by a logophoric center that is in principle possible in Moksha; see (38). In this example, the reflexive is embedded into the subject of the finite clause, so that there is no local c-commanding antecedent and the reflexive refers to the speaker and its associates.

(38) ⟨...⟩ a **es'** vel'ə-n' s'ora-n'əkə tu-j̊-t' l'ijɛ
and self village-GEN boy-1PL.POSS[NOM] go-NPST.3-PL other
vel'-i s'or... s't'ər'-ən'd'i.
village-LAT <girl> girl-DAT
'... and boys from our village go to girls from another village.'
(Toldova & Shalganova 2018: 655 (the sentence from text 'Easter'))

Following Charnavel & Sportiche (2016), Charnavel (2019), and Charnavel & Bryant (2022), logophoric binding is excluded if a reflexive refers to an inanimate object, because inanimate objects cannot constitute a perspectival center. In (39), reflexive *es'* has an inanimate antecedent.

(39) T'ɛ **kn'iga-s'$_i$** maks-i **es'$_i$**
this book-DEF.SG[NOM] give-NPST.3[SG] self
luv-ij-ənzə-n'd'i nad'əja-ma.
read-PTCP.ACT-3SG.POSS.PL-DAT hope-NZR
'This book$_i$ gives hope to its$_i$ readers.'

Example (40) shows that in this case binding is impossible in the absence of an overt c-commanding antecedent.

(40) ***Es'** luv-ij-ənzə kelk-saz' t'ɛ
self read-PTCP.ACT-3SG.POSS.PL[NOM] love-NPST.3.O.3PL.S this
kn'iga-t'.
book-DEF.SG.GEN
Intended: 'Its$_i$ readers love this book$_i$.'

Applied to relative clauses, reflexives with an inanimate antecedent show the same dependency from the case marking on the head noun that was attested earlier. In examples (41) and (42), the head is marked by the internal case and binding in the relative CP is successful.

(41) NOM ← DAT
Es'$_i$ luv-ij-ənzə-**n'd'i** [kona-t'n'ə-n'd'i t'ɛ
self read-PTCP.ACT-3SG.POSS.PL-DAT which-DEF.PL-DAT this
kn'iga-s'$_i$ maks-i nad'əja-ma] uč-i̊j-t' pe.
book-DEF.SG[NOM] 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.'

(42) NOM ← GEN
Es'$_i$ fundamənt-**ənc** [kona-n' vel'd'ə t'ɛ
self house-3SG.POSS.SG.GEN which-GEN through this
kuc'$_i$ ašč-i] n'ingə af naksad-i.
house.DEF.SG[NOM] be-NPST.3[SG] yet NEG rot-NPST.3[SG]
'Its$_i$ foundation thanks to which this house$_i$ is standing is not rotting.'

The binding of the reflexive in the relative CP is impossible if the head noun is marked for the external case.

(43) ***Es'** luv-ij-ənzə [kona-t'n'ə-n'd'i t'ɛ
self read-PTCP.ACT-3SG.POSS.PL[NOM] which-DEF.PL-DAT this
kn'iga-s' maks-i nad'əja-ma] uč-ij̊-t' pe.
book-DEF.SG[NOM] give-NPST.3[SG] hope-NZR wait-NPST.3-PL end
Intended: 'Its$_i$ readers whom this book$_i$ gave hope are waiting for the continuation.'

(44) ***Es'** fundamənt-**əc** [kona-n' vel'd'ə t'ɛ
self house-3SG.POSS.SG[NOM] which-GEN through this
kuc' ašč-i] n'ingə af naksad-i.
house.DEF.SG[NOM] be-NPST.3[SG] yet NEG rot-NPST.3[SG]
Intended:'Its$_i$ foundation thanks to which this house$_i$ is standing is not rotting.'

To sum up, the anaphor in the head of the relative clause in Moksha can be bound in the relative CP only if the head noun is marked for the internal case. These data strongly suggest that heads with an internal case are present inside the relative CP and for this reason binding there is allowed. Heads marked for the external case, on the contrary, must be not present in the relative CP. Data also confirm that the anaphor binding is a reliable diagnostic, at least once possible confounds are excluded.

Finally, note that unlike the data on idioms in the last section, anaphor binding does not show a further dependency between case and binding in the main clause. Examples (45) and (46) (repeated from section 2.3.2) show that the anaphor in the main clause can be bound regardless of whether the head noun shows internal or external case marking. Given that anaphor binding can apply at any stage of the derivation (cf. Barss (1986, 2001)), this result is expected.

(45) GEN ← DAT
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[NOM]
Vas'ɛ$_i$ dagə pet'-əz'ə.
Vasja[NOM] again repair-PST.3SG.O.3SG.S
'Vasja$_i$ again repaired his$_i$ car that a lot of money was invested into.'

(46) **Es'$_i$** mašina-**nc** [kona-n'd'i put-f lama jarmak]
self car-3SG.POSS.SG.GEN which-GEN put-PTCP.RES many money[NOM]

Vas'ɛ$_i$ dagə pet'-əz'ə.
Vasja[NOM] again repair-PST.3SG.O.3SG.S
'Vasja$_i$ again repaired his$_i$ car that a lot of money was invested into.'

3.3.3 Variable binding

Overview

This diagnostic as well as the next one are based on variable binding and differ in whether the head noun contains a variable or a binder. Here I will start with cases of the first type where the head noun contains the variable (see Åfarli (1994), Sauerland (1998), Bianchi (1999), and Bhatt (2002)). Data in (47)-(48) show that the variable in the head can be bound by the quantified noun phrase (QNP) inside the relative CP if this QNP c-commands the relativized position.

(47) a. John generally has an opinion of **his$_i$** book [that **every novelist$_i$** respects].
b. **Every novelist$_i$** respects [John's/an opinion of **his$_i$** book].

(48) a. ??John generally has an opinion of **his$_i$** book [that is useful to **every author$_i$**].
b. ??[John's opinion of **his$_i$** book] is useful to **every author$_i$**.
(Bhatt 2002: 52)

The pronoun in the head is bound by the QNP in the relative CP in (47a), but the bound variable interpretation is significantly degraded in (48a). The difference between these two examples lies in the respective positions of the QNP and the relativized position: The QNP c-commands the gap position in (47a), but not in (48a). Thus, if the head noun is merged inside the relative CP in the relativized position, it is c-commanded by the QNP in (47a), but not in (48a). The contrast between these two examples is then easily derived if the head noun is merged inside the relative CP. The data thereby argue for the relative CP internal position of the head noun. It can be derived by the raising analysis, under which the head noun phrase is merged inside the relative CP and then moves to a position in the main clause. The data are also accounted for by the versions of matching, under which the internal instance of the head gives rise a bound variable interpretation and the external head is deleted at LF (see Munn (1994), Citko (2001), and Salzmann (2017)). The binding of a variable in the head is problematic for other versions of matching as well as for the head external approach.

This diagnostic test is however not universally accepted (see, e.g., Donati & Cecchetto (2011) and Salzmann (2018)), but was argued to raise further empirical and theoretical questions. One of them comes from the observation by Hulsey & Sauerland (2006) that a quantifier inside the relative CP can scope over the main clause material. According to them, the most natural interpretation of (48) is the one

where each person sent a separate picture, i.e., definite article *the* in the head noun is interpreted in the scope of quantifier *everybody* that is inside the relative CP.

(49) The picture of **himself$_i$** [that **everybody$_i$** sent in] annoyed the teacher.
(Hulsey & Sauerland 2006: 121)

Such a scope does not follow from the relative CP internal origin of the head noun, because the vast majority of analyses assume that the noun but not its determiner is merged in the relativized position (see Kayne (1994), Bianchi (1999), Salzmann (2018), i.a.). The determiner is always external, so that for (49) to receive the relevant interpretation, the quantifier must raise out of the relative CP to a position where it scopes over the head noun. The pronoun in the head then is also in the scope of the raised quantifier and can be bound. In result, the quantifier binding can be derived without the head noun being present inside the relative CP.

This alternative is by far not unproblematic: Quantifier raising usually proceeds to Ā-positions, from which some types of binding including pronominal binding do not apply. Also, as pointed out by Hulsey & Sauerland (2006), movement of a quantifier across a co-indexed variable is a configuration that is expected to be ungrammatical due to the weak crossover effect.[16]

The next empirical problem comes from the work by Cecchetto (2005) who has argued on the basis of Italian that binding of a variable in the head noun is more restricted and in fact possible only in copular identity sentences (cf. (50a) vs. (50b)). Example (50a) presents an identity sentence and the QNP in the relative CP can bind the variable in the head. Pronominal binding is however ruled out in the regular subject-predicate sentence; see (50b).

(50) a. Il **proprio$_i$** fallimento [che **nessuno$_i$** dimentica] è quello che è
the self failure that nobody forgets is the.one that is
avvenuto per primo.
happened for first
'Their$_i$ own failure that nobody$_i$ forgets is the one that happened first.'

b. *Il **proprio$_i$** fallimento [che **nessuno$_i$** dimentica] è avvenuto per
the self failure that nobody forgets is happened for
primo.
first
'Their$_i$ own failure that nobody$_i$ forgets happened first.' (Cecchetto 2005)

At the same time, Salzmann (2017: 73-74) points out that the literature contains a number of examples where variable binding into the head is possible in the regular subject-predicate sentences in Italian (see, for instance, (51)) as well as in other

[16] Furthermore, quantifier raising out of the relative clause proposed by Hulsey & Sauerland (2006) is unexpected from the perspective of the locality restrictions on QR (see, e.g., Cecchetto (2004)). Interestingly, however, Sichel (2018) claims that raising relative clauses are transparent for movement. If so, the raising of the quantifier out of the relative CP and subsequent binding of a variable in the head noun might be taken to be an argument for the raising derivation, just not in the way it was originally intended.

languages (see examples from English above).

(51) La parte del **suo$_i$** stipendio [che ho anticipato ad **ogni impiegato$_i$**]
the part of self salary that I paid.in.advance to every clerk
verrà sottratta dalla busta paga.
will.be deducted from.the envelope pay
'The part of his salary that I paid in advance to every clerk will be deducted from the pay-sheet.' (Bianchi 1999: 124)

Thus, the data in (50a)-(50b) present an interesting contrast that if correct needs to be accounted for, but binding of a variable in the head of a relative clause in Italian does not seem to be restricted to copular identity sentences more generally.

Another empirical concern was recently raised by Radó, Konietzko, & Sternefeld (2018). The data come from the word-by-word self-paced reading experiments with German native speakers. Two of the sentences used in the experiment are given in (52). They both contain bound pronoun *seine* in the head and the QNP inside the relative CP, but differ in that the QNP c-commands the relativized position in (52a), but not in (52b). This means that the QNP c-commands the bound variable if the head noun is merged within the relative CP in (52a), but there is no c-command between the quantifier and the variable at any stage of the derivation in (52b). The data are thus parallel to the English examples (47a) and (48a), which show a contrast in grammaticality depending on whether the QNP c-commands the variable in its original position. Radó et al. (2018) argue that this contrast is absent in German.

(52) a. **Seine** Ärztin, [die **jeder** **Patient** seit
his doctor.NOM/ACC who.NOM/ACC every.NOM patient since
Langem gekannt hat], hat ihm ein teures Medikament
long known has has for-him an expoensive medication
verschrieben.
prescribed
'His doctor who every patient has known for a long time prescribed him an expensive medication.'

b. **Seine** Ärztin, [die **jeden** **Patienten** seit
his doctor.NOM/ACC who.NOM/ACC every.ACC patient.ACC since
Langem gekannt hat], hat ihm ein teures Medikament
long known has has for-him an expensive medication
verschrieben.
prescribed
'His doctor who has known every patient for a long time prescribed him an expensive medication.' (Radó et al. 2018: 411)

In the experiment, comprehension questions were used to check the availability of bound variable readings. The answers show that around one third of all participants allow for the bound readings. Slightly more participants allow for the bound reading of the pronoun in (52a), but the difference is not statistically significant. This suggests that c-command between the quantified noun phrase and the variable plays no role.

This leads us to deeper theoretical problems of this diagnostic. It was also noted that in English pronouns can be sometimes bound despite not being c-commanded by a QNP. For instance, the widely cited example (53) shows that the QNP inside the relative CP binds the pronoun that is in the main clause, but is not part of the head noun.

(53) The woman [whom **every true Englishman**$_i$ most reveres] is **his**$_i$ mother. (Geach 1964: 174)

Some approaches suggest that binding of the variable outside of a head noun as in (53) is attested only in identity sentences (see Lakoff (1970), but also Sharvit (1999)) and tie this possibility to the syntax of copular sentences. In particular, it was suggested that the post-copular part of the sentence contains the binder, but it receives no phonological realization (cf. Schlenker (2003) and Romero (2005, 2018)). This prevents the analysis from applying to the subject-predicate sentences as in (47a), where the bound variable is in the head of the relative clause.

While some specific cases of binding from a non-c-commanding position as in (53) may indeed have an alternative explanation, this seems to be just one of the numerous examples where variable binding is possible without c-command between a QNP and a pronoun; for other examples, see, for instance, the 'almost c-command' sentences (as Hornstein (1995: 108) calls them) in (54a-b) or seemingly more complex cases illustrated in (54c-e).

(54)
a. [[**Every author's**]$_i$ editor] followed **his**$_i$ instructions.
b. [Somebody from **[every city**]$_i$] despises **its**$_i$ architecture. (May 1988: 89)
c. [Every daughter of every professor in **[some small college town**]$_i$] wishes she could leave **it**$_i$. (Higginbotham 1980: 690)
d. I then caught **[each fish**]$_i$, measured **it**$_i$, and placed **it**$_i$ in the plastic container. (Barker 2012: 623)
e. **[Each boy**]$_i$ walked to the stage. **He**$_i$ took his diploma from the dean and returned to his seat. (Nouwen 2020)

Sentences as in (54) bring us to an elaborate debate on the necessary and sufficient conditions for variable binding. While I will not be able to give justice to the variety of existing literature (see Déchaine & Wiltschko (2017) and Nouwen (2020) for recent overviews), the approaches can be divided into two types. Approaches of the first type claim that c-command between the QNP and the co-varying pronoun is required (see, e.g., Reinhart (1983), Heim & Kratzer (1998), and Büring (2001)). To account for examples as in (54), these approaches often postulate an additional structure in the pronoun and sometimes also in the big DP that contains the quantifier. Approaches of the second type derive variable biding by postulating somewhat more complex semantic representations, but without an appeal to the c-command in syntax; see, for

instance, Barker (2002, 2012)) as well as Jacobson (1994), Jacobson (2018), Sternefeld (2018), and also Barker (2018) for such analyses of variable binding in relative clauses. Under these approaches, binding of a variable in the head of the relative clause by a quantifier inside the relative CP is by no means an argument for the relative CP internal origin of the head noun. Interestingly, however, it is also not immediately clear that the diagnostic based on binding of a variable in the head works as originally intended under approaches of the first type (which rely on c-command in general) after they are adjusted to incorporate the data as in (54). The additional syntactic or semantic mechanisms required to derive binding from seemingly non-c-commanding positions might also apply to derive binding into the head noun without it actually being present in the relative CP. With this (rather unsatisfying) conclusion, I will end this general overview and turn to variable binding in Moksha.

Data

Personal pronouns as well as reflexives can be bound by QNPs in Moksha. I will start with cases where the reflexive plays a role of a bound variable. This is illustrated in (55). A reflexive pronoun is preferred here, presumably because the variable is locally c-commanded by its binder in this case.

(55) **Ɛr'** **s'ora-n'ɛ-s'$_i$** and-əz'ə **es'$_i$**
every boy-DIM-DEF.SG[NOM] feed-PST.3SG.O.3SG.S self
pin'ə-nc.
dog-3SG.POSS.SG.GEN
'Every boy$_i$ fed his$_i$ dog.'

Example (56) shows that at least in some cases the reflexive pronoun cannot co-vary with a QNP that does not c-command it.

(56) *__Es'$_i$__ pin'ə-c susk-əz'ə **ɛr'**
self dog-3SG.POSS.SG[NOM] bite-PST.3SG.O.3SG.S every
s'ora-n'ɛ-t'$_i$.
boy-DIM-DEF.SG.GEN
Intended: 'His$_i$ dog bit every boy$_i$.'

In relative clauses, binding of the reflexive by a QNP shows the by now familiar correlation between case and connectivity: In (57), the head noun is marked for the internal case and binding into the head noun succeeds.

(57) NOM ← GEN
Es'$_i$ pin'ə-**nc** [kona-n' **ɛr'** **azər-s'$_i$**
self dog-3SG.POSS.SG.GEN which-GEN every owner-DEF.SG[NOM]
t'er'd'-si] van-ft-əz'ən' žuvata-t'n'ə-n'.
call-NPST.3SG.O.3SG.S see-CAUS-PST.3PL.O.3SG.S animal-DEF.PL.GEN
'His$_i$ dog that every owner$_i$ calls was guarding the animals.'

In (58), the head shows case assigned in the main clause and the sentence is judged as ungrammatical due to the inability to bind a variable in the head.

(58) *Es'$_i$ pin'ə-c [kona-n' ɛr' azər-s'$_i$
self dog-3SG.POSS.SG[NOM] which-GEN every owner-DEF.SG[NOM]
t'er'd'-si] van-ft-əz'ən' žuvata-t'n'ə-n'.
call-NPST.3SG.O.3SG.S see-CAUS-PST.3PL.O.3SG.S animal-DEF.PL.GEN
Intended: 'His$_i$ dog that every owner$_i$ calls was guarding the animals.'

The dependency between variable binding and case suggests that there is the relative CP internal representation of the head noun for relatives with the ICA, but not for regular externally-headed relatives. This conclusion is based on the data where the reflexive plays a role of the bound variable. I will next turn to cases where personal pronouns are used as variables and show that the empirical picture is different then.

Example (59) illustrates a simple case where the third person pronoun is bound by the QNP. The QNP does not c-command the pronoun, but is embedded into the noun phrase that does. If the QNP were not further embedded, but c-commanded the pronoun, the reflexive would be used.

(59) [Ɛr' s'ora-n'ɛ-t'$_j$ s'estra-c]
every boy-DIM-DEF.SG.GEN sister-3SG.POSS.SG[NOM]
s'ɛv-əz'ə son'$_{i/j}$ kruška-nc.
take-PST.3SG.O.3SG.S PRON.3SG.GEN cup-3SG.POSS.SG.GEN
'Every boy's$_j$ sister took his$_{i/j}$ cup.'

The pronoun can be also used if a QNP c-commands the pronoun, but is not in the local binding domain as, for instance, in (60) (repeated from section 2.3.2), where the variable is embedded in the lower clause.

(60) Ɛr' s'ora-n'ɛ-s'$_j$ soda-si [što
every boy-DIM-DEF.SG[NOM] know-NPST.3SG.O.3SG.S that
son'$_{i/j}$ d'ɛd'a-c kurək sa-j].
PRON.3SG.GEN mother-3SG.POSS.SG[NOM] soon come-NPST.3[SG]
'Every boy$_j$ knows that his$_{i/j}$ mother will come soon.'

At the same time, there are cases where binding of the third person pronoun is not possible from a non-c-commanding position; see (61).

(61) Son'$_{i/*j}$ kn'iga-c aščˇ-i ɛr'
PRON.3SG.GEN book-3SG.POSS.SG[NOM] be-NPST.3[SG] every
s'ora-n'ɛ-t'$_j$ komnata-sə-nzə.
boy-DIM-DEF.SG.GEN book-IN-3SG.POSS
'His$_{i/*j}$ book is in every boy's$_j$ room.'

Let's now test variable binding of personal pronouns in relative clauses. Example (62) contains the relative clause with the internal case. It shows that a pronoun in the head can be bound by a QNP in the relative CP. The QNP in this example is

embedded in the noun phrase that occupies the subject position and the relativized position corresponds to the direct object position.

(62) NOM ← GEN

Son'$_{i/j}$ kel'gəma igruška-**nc** [kona-n' [**ɛr'**
PRON.3SG.GEN favorite toy-3SG.POSS.SG.GEN which-GEN every
s'ora-n'ɛ-t'$_j$ d'ɛd'a-c] kand-əz'ə __
boy-DIM-DEF.SG.GEN mother-3SG.POSS.SG[NOM] bring-PST.3SG.O.3SG.S
bal'n'ica-s] l'ezd-i af pel'ə-m-s vrač-də.
hospital-ILL help-NPST.3[SG] NEG fear-INF-ILL doctor-ABL
'His$_{i/j}$ favorite toy that every boy's$_j$ mother brought to the hospital helps him to be not scared of doctors.'

Example (63) presents the relative clause with the external case. The bound variable interpretation is judged as grammatical here as well.

(63) **Son'$_{i/j}$** kel'gəma igruška-**c** [kona-n' [**ɛr'**
PRON.3SG.GEN favorite toy-3SG.POSS.SG[NOM] which-GEN every
s'ora-n'ɛ-t'$_j$ d'ɛd'a-c] kand-əz'ə __
boy-DEF.SG.GEN mother-3SG.POSS.SG[NOM] bring-PST.3SG.O.3SG.S
bal'n'ica-s] l'ezd-i af pel'ə-m-s vrač-də.
hospital-ILL help-NPST.3[SG] NEG fear-INF-ILL doctor-ABL
'His$_{i/j}$ favorite toy that every boy's$_j$ mother brought to the hospital helps him to be not scared of doctors.'

Thus, the pronoun in the head can co-vary with a QNP in the relative CP independently of the case marking on the head noun. This result differs from the pattern we have seen so far in that there is no correlation between case and connectivity. If the assumption that the head noun must be in the relativized position for the variable binding to apply is correct, these data indicate that heads with both internal and external case must be present in the gap position. This contradicts my previous conclusion that only heads with the internal, but not external case are present in the relative CP. This earlier conclusion was based on the interpretation of idioms and binding of reflexives. In attempt to reconcile it with the data on pronominal binding, I will now explore whether the position inside the relative CP is indeed crucial for the bound variable interpretation. If the position of the head in the relative CP indeed determines the possibility of variable binding into the head, we expect a bound variable interpretation to be ungrammatical if positions of the QNP and the variable in the relative CP are reversed. This is, however, not the case: In examples (64) and (65), the relativized position (and correspondingly the head noun) is the subject of the relative CP, while the QNP is embedded in the noun phrase that is lower in the relative CP. Nevertheless, a bound variable interpretation is grammatical in both examples. The head noun is marked by the internal case in (64).

(64) GEN ← NOM

Son'$_{i/j}$ kel'gəma igruška-**c** [kona __
PRON.3SG.GEN favorite toy-3SG.POSS.SG[NOM] which[NOM]
ašč-i **ɛr' s'ora-n'ɛ-t'$_j$** komnata-sə] vrač-t
be-NPST.3[SG] every boy-DEF.SG.GEN room-IN doctor-PL
ur'ada-z'.
take.away-PST.3.O.3PL.S
'His$_{i/j}$ favorite toy that is in every boy's$_j$ room doctors took away.'

Example (65) illustrates the relative clause with the external case marking.

(65) **Son'$_{i/j}$** kel'gəma igruška-**nc** [kona __
PRON.3SG.GEN favorite toy-3SG.POSS.SG.GEN which[NOM]
ašč-i **ɛr' s'ora-n'ɛ-t'$_j$** komnata-sə] vrač-t
be-NPST.3[SG] every boy-DEF.SG.GEN room-IN doctor-PL
ur'ada-z'.
take.away-PST.3.O.3PL.S
'His$_{i/j}$ favorite toy that is in every boy's$_j$ room doctors took away.'

To sum up, variable binding into the head of the relative clause shows a twofold result. If the reflexive is used, the bound variable interpretation is grammatical for relative clauses with the internal, but not the external case. If the personal pronoun is used, the bound interpretation is possible for both relatives with the internal and the external case. It is, however, also possible if the gap (and, thus, the bound pronoun in the relative CP) is structurally higher than the QNP. This shows that quantifier binding of reflexives and personal pronouns differ (cf. Baltin, Déchaine, & Wiltschko (2015), Déchaine & Wiltschko (2017)): Reflexives are subject to syntactic constraints, most notably the c-command by the binder (the QNP in this case), while personal pronouns are not. I suggest that bound variable interpretation of reflexives reliably diagnoses the position of the head noun in the relative CP, but the state of affairs differs for personal pronouns. Since bound interpretation does not depend on the respective positions of the gap and a QNP in the relative CP, the presence of the head noun in the gap position is not expected to facilitate binding of the pronoun. Pronominal binding into heads with the external and the internal case therefore does not show that heads with either case are present in the relative CP. I conclude pronominal binding as it stands does not constitute a good test for the first merge position of the head noun (see Salzmann (2018) for the same conclusion).

One theoretical challenge now is to reconcile these findings with the data in (61) (repeated in (66)) showing that the bound variable interpretation is ungrammatical if a pronoun c-commands a quantified noun phrase as well as with the data from section 2.3.2, where I use variable binding as a diagnostic for the base position of the whole relative clause. The data there show that a quantifier in the main clause can bind a variable in relatives with the external or internal case, but not in correlatives. I take these data to show that relatives with the internal and the external case are base merged in the argument position, while correlatives are base merged at the left

periphery of the main clause.

(66) **Son'$_{i/*j}$** kn'iga-c aščˇ-i **ɛr'**
PRON.3SG.GEN book-3SG.POSS.SG[NOM] be-NPST.3[SG] every
s'ora-n'ɛ-t'$_j$ komnata-sə-nzə.
boy-DIM-DEF.SG.GEN book-IN-3SG.POSS
'His$_{i/*j}$ book is in every boy's$_j$ room.'

The results in this section, on the one hand, question the legitimacy of using pronominal binding as a diagnostic for the syntactic position in the previous chapter. On the other hand, pronominal binding in the previous chapter shows the same result as other diagnostics: the use of the correlate, extractions out of islands, anaphor binding, and coordination with a case marked noun phrase. Together with the judgments in (66), this suggests that pronominal binding nevertheless can sometimes reflect syntactic structure. The attested differences in pronominal binding here and in 2.3.2 require further research on the distribution of bound pronouns, the role of c-command, and restrictions on E-type interpretation in Moksha as well as cross-linguistically. I will not undertake this task in this dissertation.

3.3.4 Crossover effects

Overview

This diagnostic also involves variable binding, but differs from the previous one in that it is the head of the relative clause that contains a quantifier, while the variable is inside the relative CP. Safir (1999) observed that a pronoun in the relative CP can co-vary with a QNP inside the head noun if the relativized position c-commands this pronoun in this relative CP. The bound variable interpretation is ungrammatical if the pronoun or a noun phrase that includes it c-command the relativized position instead. The contrast is illustrated in (67) and (68).

(67) a. *Pictures of **anyone$_i$** [which **he$_i$** displays prominently __] are likely to be attractive ones.
b. Pictures of **anyone$_i$** [which __ put **him$_i$** in a good light] are likely to be attractive ones.

(68) a. *?Pictures of **anyone$_i$** [that **his$_i$** agent likes __] are likely to be attractive.
b. Pictures of **anyone$_i$** [that __ please **his$_i$** agent] are likely to be attractive. (Safir 1999: 611)

In all four sentences above, the head of the relative clause contains the quantifier and c-commands the pronoun that this quantifier intends to bind. The bound variable interpretation is however allowed only in (67b) and (68b). In these examples, but not in (67a) and (68a), the gap inside the relative CP c-commands the variable. If the head noun is first merged in the gap position and moves to its surface position

from there, the contrast instantiates the crossover phenomenon (see Postal (1971) and Wasow (1972)). Example (67a) shows the secondary strong crossover effect and (68a) the secondary weak crossover effect.

Since crossover effects essentially present an additional restriction on a co-construal between a QNP and a variable, their analysis strongly depends on how variable binding is derived. As discussed in the previous section, some approaches to variable binding rely on syntactic structure and c-command, while others derive the data without an appeal to such notions. Under the approaches of the first type, crossover effects can be informally described as a prohibition on the movement of a quantified antecedent over a variable bound by it. This applies to examples (67) and (68) if the head of the relative clause is merged inside the relative CP in the relativized position and moves to the position where it is realized. Examples in (67b) and (68b) are grammatical because the noun phrase containing the quantifier c-commands the pronoun both before and after the movement. In (67a) and (68a), the quantifier moves across the variable that it binds and this leads to ungrammaticality. Note that specific analyses subsumed under this type of approach can significantly vary: For instance, crossover effects can be derived by a representational constraint on respective positions of variables and their binders (see Safir (2004, 2019)) or follow from the inability of the quantifier to bind a variable in its displaced position, which in turn can be due to a mismatch in semantic types or interpretation of a moved phrase in its launching site (see Sauerland (1998), Van Urk (2015), Keine (2016), and Keine & Poole (2018)). Importantly, for any of these analyses to be applicable to the relative clause data in (67) and (68), the head of the relative clause must originate inside of the relative CP. The data, thus, argue for the relative CP internal position of the head noun.

The situation is different under approaches that derive variable binding without appeal to c-command. Such approaches model crossover effects in different ways: For instance, Jacobson (1999) simply includes into the model a rule that produces an effect of binding a pronoun by a higher argument slot, but not by a lower one. Shan & Barker (2006) and Barker (2018), on the other hand, complicate syntactic categories so that a binder of a pronoun can be only to its left. These approaches do not require to postulate syntactic movement in order to account for effects of crossover and therefore can model the contrast between (67) and (68) without the head of the relative clause being merged inside the relative CP. Crossover phenomena then do not argue for the relative CP internal position of the head noun.

Before closing this section, it should be noted that the original argument presented by Safir (1999) is further complicated by the difference between complements and adjuncts: While complements give raise to the contrast illustrated in (67) and (68), if the quantifier is within an adjunct, binding of a variable turns out to be possible independently from respective positions of the gap and a variable inside the relative clause; see (69) and (70).

(69) a. Pictures on **anyone's$_i$** shelf [which **he$_i$** displays prominently __] are likely to be attractive ones.
b. Pictures on **anyone's$_i$** shelf [which __ put **him$_i$** in a good light] are likely to be attractive ones.

(70) a. Pictures on **anyone's$_i$** shelf [that **his$_i$** agent likes __] are likely to be attractive.
b. Pictures on **anyone's$_i$** shelf [that __ please his$_i$ agent] are likely to be attractive. (Safir 1999: 612)

The data in (69) and (70) are parallel to the data in (67) and (68) with the only difference that the quantifier is embedded in the adjunct of the head noun: The position of the gap c-commands the pronoun in examples (69b) and (70b), while the pronoun in (69a) and the noun phrase that includes the pronoun in (70b) c-command the relativized position. This however does not result in crossover effects and the pronominal binding is grammatical in all four examples.

Safir (1999: 602-603) proposes that these data strengthen the argument in favor of the relative CP internal origin of the head noun, because the same asymmetry between adjuncts and complements is attested for movement of the relative pronoun as well as for other instances of wh-movement and topicalization. He suggests to account for these data by late merge of adjuncts (see Lebeaux (1990)). Applied to the relative clauses, this means that adjuncts but not complements of the head noun are merged late in the landing site, so that the quantifier never moves across the bound variable in (69) and (70). Similarly, Bhatt (2002) suggests that the asymmetry between different types of modifiers presents a significantly more serious challenge for approaches to crossover effects that do not rely on syntactic movement. In fact, however, the adjunct-argument asymmetry appears to be an additional complication for both types of approaches. Moreover, if the data are correct and the asymmetry is attested with the regular wh-movement, then it has to be accounted for by any approach and if it turns out to be impossible, more than the account of the relativization is at stake.

Data

In this section, I will present data on crossover effects in Moksha relative clauses. I will test configurations with reflexive and personal pronouns as bound variables in relative clauses with the external and with the internal case. Similarly to the data in the previous section, no effect will be observed here. I will tentatively suggest that this result in Moksha might be due to the scrambling of head noun that appears before movement to Ā-position and subsequent binding from this intermediate position (see Webelhuth (1992)).

I will start with cases where an anaphor plays a role of a variable and the head of the relative clause is the QNP. Examples (71) and (72) contain relative clauses

with the external case and differ in that the relativized position in the relative CP c-commands the variable in (71), but not in (72). If the head noun with external case were first merged in the relative CP, the later example would be expected to show the crossover effect.

(71) **ƐrI** t'ɛd'ɛ-t'i$_{\mathbf{i}}$ [kona __ kel'k-si **es'**$_{\mathbf{i}}$
every mother-DEF.SG.GEN which[NOM] love-NPST.3SG.O.3SG.S self
id'-ənc] škola-n'kə l'ezd-i.
child-3SG.POSS.SG.GEN school-1PL.POSS help-NPST.3[SG]
'Our school helps every mother$_i$ that loves her$_i$ child.'

(72) **ƐrI** t'ɛd'ɛ-s'$_{\mathbf{i}}$ [kona-n' **es'**$_{\mathbf{i}}$ s'ora-c
every mother-DEF.SG[NOM] which-GEN self child-3SG.POSS.SG[NOM]
kel'k-si __] t'ɛ-z'-i pičəd'-ə.
love-NPST.3SG.O.3SG.S PROH-OPT-NPST.3[SG] worry-CN
'Every mother$_i$ that her$_i$ son loves does not worry.'

The data show that in these examples, the reflexive can be bound by the quantified head, so that the c-command relation between the reflexive and the gap position plays no role. This suggests that heads marked for the external case show no connectivity to the gap position.

Data in (73) and (74) illustrate that variable binding is also possible and shows no correlation with c-command in the relative CP if a head is marked for the internal case:

(73) DAT ← NOM
ƐrI t'ɛd'ɛ-**s'**$_{\mathbf{i}}$ [kona __ kel'k-si **es'**$_{\mathbf{i}}$
every mother-DEF.SG[NOM] which[NOM] love-NPST.3SG.O.3SG.S self
id'-ənc] škola-n'kə l'ezd-i.
child-3SG.POSS.SG.GEN school-1PL.POSS help-NPST.3[SG]
'Our school helps every mother$_i$ that loves her$_i$ child.'

(74) NOM ← GEN
ƐrI t'ɛd'ɛ-**t'**$_{\mathbf{i}}$ [kona-n' **es'**$_{\mathbf{i}}$ s'ora-c
every mother-DEF.SG.GEN which-GEN self child-3SG.POSS.SG[NOM]
kel'k-si __] t'ɛ-z'-i pičəd'-ə.
love-NPST.3SG.O.3SG.S PROH-OPT-NPST.3[SG] worry-CN
'Every mother$_i$ that her$_i$ son loves does not worry.'

One explanation of why crossover effects are not attested in these examples deals with the position of the quantifier: Raising and matching approaches widely assume that elements such as quantifiers or determiners are always external to the relative CP (see Kayne (1994), Bianchi (1999), Salzmann (2018), i.a.). In that case, quantifiers do not move across bound variables in the examples above even if head nouns are merged in relative CPs.

This confound is circumvented if secondary crossover phenomena are used; that is, if a QNP is deeper embedded into the head noun. The QNP then does not c-

command the variable. As shown in the previous section, the personal pronoun rather than the reflexive is used as a bound variable then:

(75) [**ɛr'** **s'ora-n'ɛ-t'$_i$** s'estra-c]
every boy-DIM-DEF.SG.GEN sister-3SG.POSS.SG[NOM]
sɛv-əz'ə **son'$_i$** (/ *es'$_i$) kruška-nc.
take-PST.3SG.O.3SG.S PRON.3SG.GEN self cup-3SG.POSS.SG.GEN
'Every boy$_i$'s sister took his$_i$ cup.'

Examples (76) and (77) contain relative clauses with the external case and differ in whether the relativized position c-commands the bound variable or vice versa. The data shows that in both examples the variable in the relative CP can be bound by the QNP embedded in the head.

(76) **ɛr'** **s'ora-n'ɛ-t'$_i$** s'estra-nc [kona __
every boy-DIM-DEF.SG.GEN sister-3SG.POSS.SG.GEN which[NOM]
sɛv-əz'ə **son'$_i$** igruška-nc]
take-PST.3SG.O3SG.S PRON.3SG.GEN toy-3SG.POSS.SG.GEN
učit'əl'-s' kr'ikənda-z'ə.
teacher-DEF.SG[NOM] scold-PST.3SG.O.3SG.S
'The teacher scolded every boy's$_i$ sister that took his$_i$ toy.'

(77) **ɛr'** **s'ora-n'ɛ-t'$_i$** s'estra-c [kona-n'
every boy-DIM-DEF.SG.GEN sister-3SG.POSS.SG[NOM] which-GEN
son'$_i$ učit'əl'-c šna-z'ə __]
PRON.3SG.GEN teacher-3SG.POSS.SG[NOM] praise-PST.3SG.O.3SG.S
l'ez-s' kud-ən' zadan'ija-t'.
help-PST.3[SG] house-GEN task-DEF.SG.GEN
'Every boy's$_i$ sister that his$_i$ teacher praised helped with home assignment.'

Similarly, no crossover effect is attested if the head noun is marked by internal case:

(78) GEN ← NOM
ɛr' **s'ora-n'ɛ-t'$_i$** s'estra-**c** [kona __
every boy-DIM-DEF.SG.GEN sister-3SG.POSS.SG[NOM] which[NOM]
sɛv-əz'ə **son'$_i$** igruška-nc]
take-PST.3SG.O3SG.S PRON.3SG.GEN toy-3SG.POSS.SG.GEN
učit'əl'-s' kr'ikənda-z'ə.
teacher-DEF.SG[NOM] scold-PST.3SG.O.3SG.S
'The teacher scolded every boy's$_i$ sister that took his$_i$ toy.'

(79) NOM ← GEN
ɛr' **s'ora-n'ɛ-t'$_i$** s'estra-**nc** [kona-n'
every boy-DIM-DEF.SG.GEN sister-3SG.POSS.SG.GEN which-GEN
son'$_i$ učit'əl'-c šna-z'ə __]
PRON.3SG.GEN teacher-3SG.POSS.SG[NOM] praise-PST.3SG.O.3SG.S
l'ez-s' kud-ən' zadan'ija-t'.
help-PST.3[SG] house-GEN task-DEF.SG.GEN
'Every boy's$_i$ sister that his$_i$ teacher praised helped with home assignment.'

These data seem to present a more reliable evidence for the absence of crossover effects in Moksha relative clauses. One problem, however, comes from the status of nominal possessors. It might be suggested that possessors are exempt from crossover effects analogous to adjuncts in English (see examples (69)-(70) above). The distinction between arguments and adjuncts in the nominal domain is more blurry than in the verbal domain, and simple diagnostics such as, for instance, obligatory presence of the modifier does not apply as nominal modifiers are always optional. All nominal modifiers were suggested to be subject to late merge by Donati & Cecchetto (2011) and if this approach is correct, QNPs in the possessor position do not have to be present in the relativized position even if the head noun is base generated there. The data, then, again do not ensure that the quantifier obligatorily moves across the variable.

Despite the mentioned suggestion that all nominal modifiers are adjuncts, I have next tested relative clauses, where QNPs are interpreted as Agents rather than as possessors of the head noun and are thus more likely to be arguments, not adjuncts. The QNP in examples (80) and (81) is interpreted as the author of the stories, not their possessor. The pronoun c-commands the gap in the relative CP in both examples, but the bound variable reading remains grammatical and does not depend on whether the head is marked by the external (as in (80)) or by the internal case (as in (81)).

(80) **ɛr' pisat'əl'-t'$_i$** azks-əc [kona-n'
every writer-DEF.SG.GEN story-3SG.POSS.SG[NOM] which-GEN
son'$_i$ jalga-c af kel'k-si
PRON.3SG.GEN friend-3SG.POSS.SG[NOM] NEG love-NPST.3SG.O.3SG.S
__] ad'əla-j kal'd'əv-stə.
end-NPST.3[SG] bad-EL
'Every writer's$_i$ story that his$_i$ friend does not like ends badly.'

(81) NOM ← GEN
ɛr' pisat'əl'-t'$_i$ azks-**ənc** [kona-n'
every writer-DEF.SG.GEN story-3SG.POSS.SG.GEN which-GEN
son'$_i$ jalga-c af kel'k-si
PRON.3SG.GEN friend-3SG.POSS.SG[NOM] NEG love-NPST.3SG.O.3SG.S
__] ad'əla-j kal'd'əv-stə.
end-NPST.3[SG] bad-EL
'Every writer's$_i$ story that his$_i$ friend does not like ends badly.'

I conclude that no crossover effects are attested in Moksha relative clauses: Binding of the variable in the relative CP by a QNP in the head is insensitive to the c-command relation between the gap and the variable as well as to the case of the head noun. This conclusion converges with the result in the previous section showing that variable binding is not determined simply by c-command. At the same time, the data in this section allow for several explanations that are compatible with c-command as a precondition for variable binding. In particular, one reason for the observed state of affairs is already mentioned earlier. It comes from the idea that all

nominal modifiers are adjuncts and can be merged late. The data might also have an alternative explanation: Crossover effects are widely observed with movements traditionally classified as Ā-movement, but are known to be obviated by A-movement (see Postal (1993), Sauerland (1998), and Büring (2004) among others). A-moved phrases can bind variables from their landing positions, so that the presence of the c-command relation before movement turns out to be irrelevant. At the same time, Moksha allows for a significant variation in word order (see section 1.2.1 for more details). Data in (82) show some of the possible re-orderings of the arguments:

(82) a. Ava-s' rama-z'ə kut-t'. (SVO)
woman-DEF.SG[NOM] buy-PST.3SG.O.3SG.S house-DEF.SG.GEN

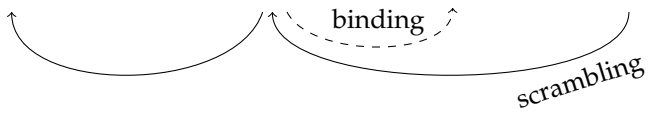
b. Ava-s' kut-t' rama-z'ə. (SOV)
woman-DEF.SG[NOM] house-DEF.SG.GEN buy-PST.3SG.O.3SG.S

c. Kut-t' ava-s' rama-z'ə. (OSV)
house-DEF.SG.GEN woman-DEF.SG[NOM] buy-PST.3SG.O.3SG.S

d. Kut-t' rama-z'ə ava-s'. (OVS)
house-DEF.SG.GEN buy-PST.3SG.O.3SG.S woman-DEF.SG[NOM]

The obviation of crossover effects by some movement types taken together with the possibility of free scrambling in Moksha opens up the following approach to the absence of crossover effects in Moksha relative clauses: Movement of the head noun to its final position can be preceded by relative clause internal scrambling of this noun phrase across a variable and binding of the variable from this intermediate position (see Webelhuth (1992)). Such a derivation is schematized in (83).[17]

(83) a. $[_{DP}\ [\ \underline{QNP_i\ ...}\ ]_{head}\ [_{CP}\ [\ \underline{QNP_i\ ...}\ ]_{head}\ ...\ pron_i\ ...\ [\ \underline{QNP_i\ ...}]_{head}\ ]\ ]$



This hypothesis is further supported by the fact that crossover effects in Moksha are not attested in other movement configurations either. For instance, the quantifier is a part of the constituent that undergoes wh-movement and crosses the variable in (84) and (85), but the bound variable interpretation is fully grammatical in both examples.

(84) [**Kodamə s'ora-n'ə-t'$_i$**] **es'$_i$** pin'ə-c
which boy-DIM-DEF.SG.GEN self dog-3SG.POSS.SG[NOM]
susk-əz'ə __ ?
bit-PST.3SG.O.3.SG.S
'Which boy$_i$ did his$_i$ dog bite?'

(85) [**Ɛr' pisat'əl'-t'$_i$** kodamə azks-ənc] **son'$_i$**
every writer-DEF.SG.GEN which story-3SG.POSS.SG.GEN PRON.3SG.GEN

[17] One may further speculate that the head noun can simply bind its variable from its final landing site. The English data presented earlier would be, however, problematic for this view.

jalga-c af kel'k-si __ ?
friend-3SG.POSS.SG[NOM] NEG love-NPST.3SG.O.3SG.S
'Which story by every writer$_i$ his$_i$ friend does not like?'

To sum up, I have shown that crossover effects in Moksha show no correlation with case of the head noun or the structural position of the relativized constituent in the relative CP. I have suggested that this state of affairs is expected given the general possibility of scrambling in Moksha, so that Ā-movement might be preceded by A-movement and variable binding may apply from the intermediate scrambling position. Note though that to derive the secondary crossover data this account still requires binding from almost c-commanding position; see the discussion in the previous subsection.

3.3.5 Condition C

Overview

The next diagnostic comes from condition C. Chomsky (1981) defines it as a requirement for R-expressions to be free, where an R-expression is free if it is not bound by a coindexed syntactic object. Condition C successfully excludes coreference between a full noun phrase and a personal pronoun c-commanding it as in (86).

(86) a. *He$_i$ admires John$_i$.
b. *She$_j$ thinks that Mary$_j$ lost her job.

The standard version of Condition C was argued to account for the core data, but leave a number of 'exceptions': It was shown to be more restrictive than required empirically excluding examples as in (87), where noun phrases corefer with c-commanding pronouns.

(87) a. (Who is this man over there?) He$_i$ is Colonel Weisskopf$_i$.
(Grodzinsky & Reinhart 1993: 78)
b. Everyone has finally realized that Oscar is incompetent. Even he$_i$ has finally realized that Oscar$_i$ is incompetent. (Evans 1980: 52)

Various amendments and changes to the original condition C were proposed to accommodate the full empirical picture. First, Heim (1982, 1998) makes a distinction between coindexation and coreference and suggests that a full noun phrase can be coreferent, but not coindexed with a c-commanding syntactic object. Coreference without coindexation is in turn possible if discourse provides different perspectives on an individual; that is, if it is comes in different *guises* in Heim's terminology. Second, Reinhart (1983) and Grodzinsky & Reinhart (1993) develop a competition-based approach according to which everything being equal a syntactic object c-commanded by its binder must be realized as a variable rather than as an

R-expression, but a full noun phrase is also allowed if its use leads to differences in interpretation. Third, Safir (2004) postulates that the use of R-expressions is not prohibited, but merely unexpected, which leaves space for pragmatic factors influencing the grammaticality of full noun phrases in certain positions. Finally, most recently, on the basis of experimental studies, Gor (2020) suggests that condition C is not an inviolable grammatical principle, but one of the factors that together with, for instance, salience determines the distribution of R-expressions.

These complications notwithstanding, condition C seems to derive correctly at least a sizable portion of the data and is widely used as a connectivity diagnostic. It is, however, different from the diagnostics discussed so far (potentially, with an exception of crossover effects) in that it is prohibitive; that is, it requires the absence of the noun phrase from a given position in order for the coreference between this noun phrase and a pronoun to be possible. For instance, structure (88) illustrates a testing configuration for relative clauses. Here, the relative CP contains the third person pronoun in the position c-commanding the relativization position and the head noun contains the further noun phrase that potentially can corefer with this pronoun. In the simplest case, the ban on coreference between the pronoun in the relative CP and this noun phrase indicates that the head noun was present in the relativized position and hence coreference leads to the condition C violation. If the pronoun and the noun phrase can refer to the same individual, then the head noun should be not represented inside the relative CP.

(88) $[_{DP}\ [_{head}\ \ldots\ \text{noun.phrase}_{\mathbf{i}}\ \ldots\ ]\ [_{CP}\ \ldots\ C_{rel}\ \ldots\ \text{pronoun}_{\mathbf{i}}\ \ldots\ \_\_{relativized.position}\ ]\ ]$

The prohibitive nature of the diagnostic introduces an additional level of complexity: The ban might not apply throughout the derivation, but only at some of its stages. Condition C is often taken to be evaluated only at LF (see Chomsky (1995b)). This breaks down the implication between the absence of condition C connectivity and absence of a noun phrase from a given position and allows for some movement to obviate condition C in a number of cases. For instance, A-movement as well as some parts of Ā-moved phrases were argued to display no connectivity with respect to condition C (see Van Riemsdijk & Williams (1981), Lebeaux (1988, 1990, 1998), Fox (1999), Safir (1999), and Takahashi & Hulsey (2009) among other). Note, however, that the application at LF is not the only way to force some syntactic objects to obey condition C and allow others to obviate it. The wholesale late merger approach (Takahashi & Hulsey (2009)) allows syntactic objects that are not supposed to be evaluated with respect to condition C to be introduced into the structure later in the derivation. In result, condition C may also apply in syntax and lead to the same selective behavior. Competition-based approaches (cf. Reinhart (1983)) also allow to derive condition C effects without appeal to its application at LF (and LF itself; see Cecchetto (2001), Sternefeld (2001)). Krifka (2018) has recently argued that such approaches can be developed to capture at least some of the aforementioned obviations by assuming

that syntactic binding is unavailable or at least less likely in some configurations.

On the empirical site, condition C connectivity has been a subject for a number of experimental studies and some of them report an empirical picture different from the one established in the classical work. Bruening & Al Khalaf (2019) carried out an experiment on the basis of English and found no effects of condition C connectivity for arguments or adjuncts of displaced noun, but observed a strong effect with complements of prepositions, adjectives, and verbs. Adger et al. (2017) also report condition C effects with adjectival predicates (except for their CP complements), but claim that for NPs condition C connectivity is observed only after a local movement. Stockwell, Meltzer-Asscher, & Sportiche (2021), on the contrary, report condition C connectivity in NPs. They claim that the effects somewhat deteriorate at longer distances, but still remain very clear. Stockwell, Meltzer-Asscher, & Sportiche (2022) further observe the contrast between nominal adjuncts and arguments. Finally, Wierzba et al. (2020) conducted similar experiments for German and report a clear evidence for condition C connectivity in both APs and NPs for arguments as well as for adjuncts. They, however, also note the influence of a distance in that coreference is more grammatical if movement proceeds over a clause boundary.

For relative clauses, the empirical picture is also not completely clear. Some studies claim that head nouns show condition C connectivity. For instance, Schachter (1973) judges the coreference between *John* in the head of the relative clause and the personal pronoun in the relative CP in (89) to be ungrammatical; for similar judgments see also De Vries (2002: 82) as well as to some extent Bianchi (1999) and Bhatt (2002)).

(89) *The portrait of **John$_i$** [that **he$_i$** painted __] is extremely flattering.
(Schachter 1973: 32)

At the same time, by now it seems to be a near consensus that there is no connectivity with respect to condition C in relative clauses (see Safir (1999), Sauerland (1998, 2003), Munn (1994), Cresti (2000), Citko (2001), Heck (2005), Salzmann (2006, 2017, 2018), and Sportiche (2017)). In examples (90) and (91), the pronoun in the relative CP c-commands the relativized position, but the coreference between the proper name contained in the head and this pronoun is judged grammatical.

(90) A picture of **John$_i$** [which **he$_i$** was very proud of __] was recently stolen.
(Safir 1999: 614)

(91) The picture of **Bill$_i$** [that **he$_i$** likes __] (Munn 1994: 204)

If relative clause heads indeed do not show connectivity with respect to condition C, the empirical picture turns out to be different from the one standardly reported for other connectivity effects that unlike condition C indicate the presence of the head noun inside the relative CP.

One way to account for this difference is to deduce it from the peculiarities of condition C. As mentioned above, movement can obviate condition C violations in various cases and the absence of condition C connectivity in relative clauses might be one of such cases. This idea is pursued by Safir (1999) and Sportiche (2017). Safir (1999) suggests that Ā-chains can be subject to a vehicle change (see Fiengo & May (1994)); that is, full noun phrases in lower copies can be interpreted as pronouns and be therefore exempt from condition C. In the same vein, Sportiche (2017) suggests that parts of copies can be neglected in some of their occurrences as long as they are interpreted in one of their positions. In result, both approaches allow the head of the relative clause to be present inside the relative CP despite the absence of condition C connectivity, and the sentences can be derived by the raising structure.

Another way to approach the absence of condition C connectivity in relative clauses is to attribute it to the peculiarities of the relative clause syntax. Data in (92) and (93) show the contrast in condition C connectivity between wh-movement (that is, a standard case of Ā-movement) and the head of the relative clause, which is assumed to move to the left periphery together with a wh-word / operator first and is therefore taken to instantiate Ā-movement as well.

(92) a. Which is the picture of **John$_i$** [that **he$_i$** likes __]?
b. *[Which picture of **John$_i$**] does **he$_i$** like __ ? (Sauerland 1998: 62)

(93) a. The pictures of **Marsden$_i$** [which **he$_i$** displays prominently __] are generally the attractive ones.
b. *[Which pictures of **Marsden$_i$**] does **he$_i$** display prominently __ ? (Sauerland 1998: 62)

The absence of condition C connectivity had a major impact on approaches to the relative clause and constitutes a core argument for the matching derivation. Under the matching derivation, the head of the relative clause is present inside the relative CP and there is another instance of the head that is first merged in the main clause and not connected to the internal head by movement. This allows to account for the absence of condition C effects in a number of ways. Munn (1994) and Citko (2001) suggest that the internal head can be freely deleted at LF due to its identity to the external head. This deletion ensures that there is no violation of condition C, which applies at LF only. Sauerland (1998, 2003), Cresti (2000), and Salzmann (2006, 2017, 2018) also capitalize on the deletion of the internal head. As a rule, the relative clause external instance of the head noun is realized at PF and the internal head is deleted. The exact nature of this deletion is not fully clear, but the process seems to be akin to ellipsis and thus, unlike a movement chain, is a standard environment for the application of the vehicle change (see Fiengo & May (1994)). The internal head is assumed to differ from the external one in that the former contains a pronoun instead of a full noun phrase and therefore cannot incur a violation of condition C.

Accounts of anti-connectivity via matching further pose a question of whether one

derivation is sufficient to derive a full range of data. Sauerland (1998, 2003) suggests that at least two derivations of relative clauses co-exist in a language: Raising is necessary to derive connectivity and matching is responsible for anti-connectivity. This point of view is supported by the re-emergence of condition C effects if the head is required inside the relative CP for other processes. Examples (94a) and (94b) constitute a minimal pair and differ in that the predicate in (94b), but not in (94a) forms the idiomatic expression with the head. This forces connectivity with respect to condition C and renders coindexing between the NP in the head and the pronoun in the CP ungrammatical. Such coreference, however, remains possible in (94a), where head is not required in the relative CP for the interpretation of the idiom. Similarly, example (95) contains an idiomatic expression in the relative CP and is claimed to be ungrammatical due to the violation of condition C.

(94) a. the picture of **Bill$_i$** [that **he$_i$** likes]
b. *the *picture* of **Bill$_i$** [that **he$_i$** *took*] (Munn 1994: 402)

(95) *The *headway* on **Mary$_i$**'s project [**she$_i$** had *made*] pleased the boss.
(Sauerland 1998: 71)

Note that this provides an argument in favor of the co-existence of two derivations only if the version of the matching derivation that requires full interpretation of both heads and thus cannot account for binding and idiomatic interpretation of the head noun inside the relative CP is assumed. Then, raising is enforced if the head noun shows connectivity with respect to a position inside the relative clause and, consequently, condition C emerges as well. This argument does not hold under the version of the matching analysis developed by Munn (1994) or Citko (2001) that allow to freely delete an external or an internal instance of the head to derive connectivity or anti-connectivity respectively. Re-emergence of condition C then naturally follows from the requirement to preserve the internal head if it is required for idiom interpretation or binding.

Re-appearance of condition C is problematic for those raising only and for matching only approaches that rely on the vehicle change to account for condition C obviation. The proponents of these approaches question the realitiy of the correlation. For instance, Salzmann (2017, 2018) suggests that ungrammaticality of examples as in (94b) and (95) has a different reason. In particular, (95) is ruled out, because *headway on Mary's project* is not a legitimate constituent. Heck (2005) also reports an absence of condition C effects in German even if the head noun shows connectivity with respect to binding or idiom interpretation.

Data

The goal of this section is to explore how Moksha relative clauses with the external and the internal case behave with respect to condition C. I will first set up the stage

by examining simpler applications of condition C and its interaction with movement. Sentences in (96) and (97) show basic cases where the full noun phrase cannot refer to the same individual as the pronoun c-commanding it.

(96) Kat'ɛ mɛr'g-s' što **son$_{j/*i}$** n'ɛj-əz'ə
Katja[NOM] say-PST.3[SG] that PRON.3SG[NOM] see-PST.3SG.O.3SG.S
Anna-n'$_i$ fətəgrafija-nc.
Anna-GEN photo-3SG.POSS.SG.GEN
'Katja said that she saw Anna's photo.'

(97) **Son$_{j/*i}$** s'ormad-əz'ə **Puškin-ən'$_i$**
PRON.3SG[NOM] write-PST.3SG.O.3SG.S Pushkin-GEN
azks-ənc.
story-3SG.POSS.SG.GEN
'He wrote Pushkin's story.'

Examples (98) and (99) introduce movement into the picture. They show that the CP internal wh-movement does not obviate the violation of condition C: The pronoun cannot be co-indexed with the noun phrase that this pronoun c-commands in the base merge structure even after the noun phrase was moved to a position where the pronoun does not c-command it anymore.

(98) Kat'ɛ az-ənd-əz'ə [kodamə **Anna-n'$_j$**
Katja[NOM] tell-FREQ-PST.3SG.O.3SG.S which Anna-GEN
fətəgrafija-nc] **son$_{i/*j}$** n'ɛj-əz'ə __ .
photo-3SG.POSS.SG.GEN PRON.3SG[NOM] see-PST.3SG.O.3SG.S
'Katja said which Anna's photo she saw.'

(99) [Kodamə **Pušnik-ən'$_j$** azks-ənc] **son$_{i/*j}$**
which Pushkin-GEN story-3SG.POSS.SG.GEN PRON.3SG[NOM]
s'ormad-əz'ə __ ?
write-PST.3SG.O.3SG.S
'Which Pushkin's story did he write?'

Since the movement of the relative clause head crosses a clause boundary and some experimental studies discussed in the previous subsection report fading of condition C effects upon a long-distance movement, I have next tested whether condition C effects persist in Moksha if movement proceeds out of an embedded CP. The data are controversial and show that cross-clausal movement repairs a violation of condition C sometimes, but not always. For instance, in (100), some speakers allow the personal pronoun in the subject position of the embedded clause to be co-indexed with proper name *Pushkin* that moves to the matrix clause as a part of the wh-phrase.[18]

[18]Note that matrix predicate shows object agreement in example (100). This might be viewed as an indication that the wh-phrase is base merged in the main clause and we deal with the so-called prolepsis construction here. Such an interpretation of data is untenable: First, factive predicates in Moksha, as a rule, show object agreement with a finite clause in their argument position (see Egorova (2018)). Second, proleptic objects are usually marked by a postposition and trigger no object agreement.

(100) [Kodamə **Puškin-ən'$_j$** kn'iga-nc] ton
which Pushkin-GEN book-3SG.POSS.SG.GEN you[NOM]
soda-sak što **son$_{i/\%j}$** s'ormad-əz'ə __
know-NPST.3SG.O.2SG.S that PRON.3SG[NOM] write-PST.3SG.O.3SG.S
dača-sə?
country.house-IN
'Which Pushkin's book you know that he wrote at the country house.'

Judgments are different for example (101). Here, on the contrary, a coreference between the pronoun in the embedded clause and proper name *Anna* moved to the upper clause as a part of the wh-phrase is ungrammatical.

(101) Kat'ɛ az-ənd-əz'ə [kodamə **Anna-n'$_j$**
Katja[NOM] tell-FREQ-PST.3SG.O.3SG.S which Anna-GEN
fətəgrafija-nc] Miša ar's'-i što **son$_{i/*j}$**
photo-3SG.POSS.SG.GEN Misha think-NPST.3[SG] that PRON.3SG[NOM]
n'ɛj-əz'ə __ ?
see-PST.3SG.O.3SG.S
Intended: 'Katja said which Anna's photo Misha thinks she saw.'

It is not completely clear to me what underlies the difference between the judgments on the two examples. One option is that the interpretation with co-reference is more salient in example (100), where the proper name refers to the famous Russian writer Pushkin and the pronoun in the relative clause is the subject of verb 'to write'. In (101), on the other hand, there are no initial expectations on whether it was Anna or someone else who saw the photo. If so, this suggests that there are further pragmatic factors that influence the coreference between a pronoun and a noun phrase after the noun phrase was moved away (cf. Gor (2020)). This, however, remains a topic for further research. For now, the conclusion is that violations of condition C persist at least in some cases of long-distance movement and with this conclusion in hand I will now turn to the relative clause data.

The data show a correlation between condition C connectivity and the case marking on the head noun. Relative clauses where the head is marked by the external case show no connectivity with respect to condition C; see (102). In this example, the full noun phrase in the head noun can corefer with the pronoun that c-commands the gap in the relative CP.

(102) **Puškin-ən'$_j$** kn'iga-c [kona-n' **son$_{i/j}$**
Pushkin-GEN book-3SG.POSS.SG[NOM] which-GEN PRON.3SG[NOM]
t'ɛšt'-əz'ə __ Pavləfskɛj dača-sə] aščː-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.'

Example (103) constitutes a minimal pair with (102) and differs only in the case

marking on the head that shows the internal case here. Coreference between the proper name in the head and the pronoun in the relative CP is not allowed.

(103) NOM ← GEN
Puškin-ən'$_j$ kn'iga-**nc** [kona-n' **son$_{i/*j}$**
Pushkin-GEN book-3SG.POSS.SG.GEN which-GEN PRON.3SG[NOM]
t'ɛšt'-əz'ə __ Pavləfskɛj dača-sə] ašč-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.'

Note that in these examples, the proper name in the head is the writer *Pushkin* and the pronoun is again the subject of the verb 'to write'. The same effect is, however, attested in neutral contexts: Example (104) shows the relative clause with the external case and the coreference between the proper name in the head and the pronoun is grammatical.

(104) **Anna-n'$_j$** jalga-nc [kona-n'd'i **son$_{i/j}$**
Anna-GEN friend-3SG.POSS.SG.GEN which-DAT PRON.3SG[NOM]
kunarə af zvon'-c'-i __] mon vas'ft-in'ə.
long.ago NEG call-FREQ-NPST.3[SG] I[NOM] meet-PST.3.O.1SG.S
'I met Anna's friend who she did not call for a while.'

Example (105) illustrates the relative clause with the internal case marking and shows that the coreference between the proper name and the pronoun is ungrammatical.

(105) GEN ← DAT
Anna-n'$_j$ jalga-**ncti** [kona-n'd'i **son$_{i/*j}$**
Anna-GEN friend-3SG.POSS.SG.DAT which-DAT PRON.3SG[NOM]
kunarə af zvon'-c'-i __] mon vas'ft-in'ə.
long.ago NEG call-FREQ-NPST.3[SG] I[NOM] meet-PST.3.O.1SG.S
'I met Anna's friend who she do not call for a while.'

To sum up, the data show the dependency between the case marking on the head and connectivity with respect to condition C. In particular, heads with the internal case cannot corefer with a pronoun inside the relative CP, while heads with the external case can. This difference between heads with the external and the internal case is derived if heads with the internal case originate in the relative CP and are therefore evaluated there for condition C. Heads with the external case are never present in the relative CP and are not c-commanded by the pronoun, so that the coreference with the pronoun is possible and not regulated by condition C. Under this analysis, data on condition C converge with the evidence on idiom interpretation and binding of reflexives presented in this chapter.

Alternatively, one might suggest that the differences in Condition C do not follow from the differences in the first merge position of heads with the external and internal

case, but are derived by the distance at which a head moves away from its base position. Both types of heads are then first merged in the relative CP, but differ in that heads with the external case move out of the relative CP, while head with the internal case remain in Spec,CP (cf. Sportiche (2017)). This approach is empirically untenable, because outside of the relative clauses the effect of the distance in Moksha is attested only in restricted number of cases (presumably, only when the coreferent interpretation is more natural) and was reported only by some speakers. The effects in relative clauses, on the contrary, were shown to be independent of a broader context. In addition, such an approach would go against the conclusion in the previous chapter (2) that relatives with ICA are externally-headed and heads with the internal case occupy regular argument positions in the main clause.

3.4 Raising and head-external derivations

3.4.1 Data summary and proposal

In this chapter, I have applied the connectivity diagnostics to relative clauses in Moksha. The data are summarized in table (106) and the results are as follows. First, idioms and binding of reflexives indicate that only heads with the internal case participate in these processes inside the relative CP; heads with the external case do not. Second, data on condition C further show that heads with the internal case must be present inside the relative CP. Third, idioms in the main clause show that there are processes in the main clause where only heads with the external case can participate. Note that the latter is not true for all operations: For instance, anaphor binding in the main clause is also possible for heads with the internal case. I suggest that this difference between idiom interpretation and anaphor binding is because idiom interpretation is determined by the base structure, while anaphor binding can apply at later stages of the derivation as well.

(106) Connectivity in Moksha relative clauses

Diagnostics	RC with ICA	RC with external case
1. Idioms in the relative clause	OK	*
2. Idioms in the main clause	*	OK
3. Anaphor binding in the relative clause	OK	*
4. Anaphor binding in the main clause	OK	OK
5. Variable binding in the relative clause: Reflexive	OK	*
6. Variable binding in the relative clause: Personal pronoun	OK	OK
7. Crossover (reflexive, personal pron.)	OK	OK
8. Condition C in the relative clause	*	OK

These data have implications for the status of the used diagnostics and for the syntax of relativization. Starting with the former, we see that idioms, binding of reflexives (by simple or quantified noun phrases), and condition C depend on the case marking of the head. I take that as evidence that these phenomena reliably diagnose syntactic structure as well as the structure of relative clauses, in particular, contrary to some recent suggestions; see Webelhuth et al. (2018) on idioms, Donati & Cecchetto (2011) on anaphor binding, Krifka (2018) on condition C. Anaphor binding in the main clause, variable binding of personal pronouns, and crossover show no correlation with the case marking on the head noun. This result is expected for anaphor binding as it is widely assumed to apply throughout the derivation (see Barss (1986, 2001)), but is surprising for pronominal binding in the relative clause and crossover. This leads us to a conclusion that neither pronominal binding nor crossover constitutes a good argument for the structure of relative clauses (see also Salzmann (2017)), at least until the conditions on the pronominal binding are better understood, so that potential intervening factors could be excluded. Note also that there are further widely assumed tests for the relative clause structure that I did not apply here. For instance, I have no data on adjectival modification that was suggested as an argument for the raising derivation by Bhatt (2002) and is much debated ever since (see Bhatt & Sharvit (2005), Heycock (2005), and Hulsey & Sauerland (2006)).

Turning now to the syntax of relative clauses, the data clearly show that properties of relative clauses with the internal and with the external case marking are different. Relative clauses with the internal case show connectivity to the position inside the relative CP. Their heads must be merged inside the relative CP and then moved to the position where they are phonologically realized. According to the conclusion from the previous chapter, this final position must be in the main clause. Thus, I suggest that the relative clauses with the internal case are derived by the raising structure.

As for the relatives with external case, one of the two options can be pursued. First, on the basis of the differing syntactic properties, one might assume that relative clauses with the external case instantiate a different derivation: the head-external one. This allows to account for the observed empirical effects in a more straightforward manner but requires a co-existence of two distinct derivations for relative clauses in the grammar. Second, one might suggest that despite empirical differences, relatives with the internal and the external case, in nutshell, represent one derivation type, but further variations within this derivation type are possible, such as for instance differences in the height of the head's final position or deletion of either external or internal head. While the approach with one derivation type might seem conceptually more attractive, in fact, variation within one type of the derivation required to account for clearly different properties of relative clauses might turn to be significant, so that in result it is not clear in which sense such an account is more unified than the alternative with two derivations.

I will pursue the first approach. I suggest that the data are best analyzed as

follows: Relative clauses with ICA are derived by raising, while relative clauses with the external case by the head-external derivation. I will spell out this approach in more detail and then show that the alternatives are untenable.

3.4.2 Analysis

In this section I will show how the combination of the raising for relative clauses with ICA and the head-external derivation for relatives with the external case captures the full set of data presented in this chapter. Here I will not delve into the details of the raising derivation nor derive further properties of relatives with internal case discussed in chapter 2, but will turn to these topics in the next chapter after this general account with two types of derivations for relative clauses in Moksha will be set up.

Let's start with the relative clauses with ICA. I suggest that they are derived by raising as schematized in (107). The head noun is base generated in the argument position in the relative CP. It obligatorily receives its case marking in this position and moves to the main clause after.

(107) Raising derivation for relatives with internal case

The derivational path of the head noun then derives the connectivity profile of these relatives. I will now once again go through the relevant diagnostics and spell out how this analysis captures them.

First, the base position of the head noun phrase inside the relative CP allows the head noun to participate in idioms inside the relative clause as the requirement for idiomatic interpretation that parts of an idiom must be first merged together (see Bach (1974), Chomsky (1980: 149-153), McCawley (1998: 57), and Bruening (2020)) is fulfilled inside the relative CP. The position of the head noun in the main clause is a derived one and consequently this condition for the idiomatic interpretation is not met there, so that the head with the internal case cannot form an idiom with a main clause material.

Second, the presence of the head noun in the relativized position allows it to be locally c-commanded by higher noun phrases inside the relative CP. Assuming that c-command is required for the binding of reflexive pronouns (see Chomsky (1981, 1986) and Reinhart (1983)), this derives the possibility of binding into the head noun from inside the relative CP. After movement, the head noun occupies the position in the main clause and can therefore also be bound there. While nothing hinges on this, I assume that the anaphor binding applies via Agree in syntax (see Hicks (2008), Rooryck & Vanden Wyngaerd (2011), i.a.).

Third, I assume that condition C also applies in syntax and cases where some parts

of a moved syntactic object can obviate it are derived by late merge (cf. Takahashi & Hulsey (2009)). Since head nouns must be in the relative clause to receive their internal case marking, the analysis also correctly predicts that heads with the internal case are evaluated for condition C inside relative CPs.

I will now turn to relative clauses with the external case. I suggest that they are derived by the head-external analysis:

(108) Head-external derivation for relatives with external case

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

Since the head noun is first merged in the main clause, it does not get the case marking inside the relative CP. It also does not participate in syntactic processes there, i.e., cannot form an idiom with a relative CP internal material, be bound there, or evaluated with respect to condition C. Idiomatic interpretation in the main clause, on the other hand, is possible because the base merged position of the head noun is in the main clause.

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 distinct analyses.

3.4.3 Alternatives

In this section, I will show that other derivations alone or in combinations do not derive the data.

Head-external only

Suppose that the head-external derivation is the single derivation available for relative clauses and it must derive the regular externally-headed relatives as well as relatives with ICA in Moksha. As shown in the previous section, the head-external derivation easily accomplishes the first task, i.e., accounts for the regular externally-headed relatives. Next, as shown in section 3.2.2, the derivation can also account for the internal case marking on the head. For this, it must be assumed that former probes can act as goals, so that the head noun can simply agree in case with the relative pronoun as in (109): see Harbert (1983), Gračanin-Yuksek (2013), and also Bader & Meng (1999), Bader & Bayer (2006), Czypionka et al. (2018)).

(109) Inverse case attraction derived by agreement

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

The challenge is, however, to incorporate the correspondence between this agreement in case and connectivity effects. In particular, Agree with the relative pronoun

must enable the interpretation of the head noun inside the relative CP. This effect 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 other its applications. I, therefore, conclude that the head-external only approach is not suitable to derive the relative clauses in Moksha.

Raising only

Suppose that raising is the only derivation of relative clauses. It must then derive both relative clauses with the internal and the external case as well as the related connectivity properties.

One version of the raising only approach was developed by Sportiche (2017). He attempts to derive the varying properties of relatives clauses, e.g., in English, by manipulating the height of the final landing site of the head noun. The raising derivation then comes in two flavors: the so-called low and high promotion. Under the low promotion, the head noun lands lower, inside the relative CP, and can be then also interpreted inside the relative CP giving rise to connectivity effects. Under the high promotion, the head noun moves to the higher position outside of the relative CP and must be also interpreted there. Since the languages that Sportiche (2017) considers always show the external case, the analysis does not attempt to correlate the low/high promotion with the case marking and, thus, does not derive the Moksha data in its current form. Nevertheless, let's explore which further assumptions could allow to incorporate the case marking.

Here is one option: Under the low promotion, the head noun does not reach the case position in the main clause and therefore cannot get external case there. Since all nouns must be case-marked, such heads must show an internal case assigned to them in the relativized position. Under the high promotion, head nouns move to the case position in the main clause and receive case there. Depending on further assumptions on case marking, heads with the external case either do not get case inside the relative CP and therefore have to move to the higher position, or they get case in the relative CP, but it is overwritten in their new position.

Under this approach, the high promotion corresponds to the regular externally-headed relative clauses in Moksha: Heads of such relatives display the external case and cannot be reconstructed inside the relative CP. The low promotion underlies relative clauses with ICA. Due to the low landing site of the head, it is marked for the internal case and can be interpreted inside the relative CP.

However, this analysis does not work as intended and here is why. First, it contradicts our earlier conclusion about the structure of relatives with ICA. This analysis requires that heads with the internal case remain inside the relative CP, while the main conclusion of chapter 2 is that they move out of the relative CP. I will not reproduce the full argumentation from the previous chapter here, but, in nutshell, I have shown there that the higher nominal projections, in particular the D

head, which are in the main clause, cannot be separated by the clause boundary from the lower nominal projections, most importantly the noun itself. Hence, the basic assumption of the raising only approach that relative clauses with ICA correspond to the low promotion is incompatible with the data.

Second, even if we ignore the conclusion of the previous chapter, the outlined approach in fact does not derive the correspondence between the height of promotion and the position where the head noun is interpreted, but simply stipulates it. There is no clear reason why heads that move to the higher position cannot be interpreted inside the relative CP. This does not follow from the distance of movement per se as long-distance movements typically show connectivity with the base generation position.

Third, such an approach also encounters problems in accounting for the individual connectivity effects. For instance, to ensure that under the high promotion (that is, for heads with the external case in Moksha), the anaphor biding cannot apply inside the relative CP in their base position, Sportiche (2017) assumes that all connectivity effects apply at LF only. This is at variance with the fact that binding of an anaphor in a displaced syntactic object is typically possible in both the landing and the launching positions. This also does not allow to account for the fact an anaphor in the head with the internal case can be bound in the relative CP as well as in the main clause.

To sum up, I have just argued that the existing version of the raising only approach developed by Sportiche (2017) does not derive relative clauses in Moksha, but this does not necessarily mean that the raising only approach is generally not viable. In the reminder of this section, I will try to envisage such an analysis.

For the raising only approach to derive the full range of Moksha data, it must be ensured that despite the same base position and derivational path, heads of relative clauses can show connectivity with different positions, and what position this is, is largely determined by where a head noun gets case. This dependency between case and connectivity somewhat 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 (leaving out further nuances, for instance, concerning adjuncts) are evaluated there for condition C as well. They are akin 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 show that heads with the external case cannot be bound in the relative CP; that is, in 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)), which again differs from the behavior of heads with the external case, which do not form idioms in the relative CP. Furthermore, Ā-moved phrases are known to be unable to bind from their landing site (see Van Riemsdijk & Williams

(1981), Safir (2019), i.a.), while heads with both the internal and external case marking in Moksha can do so.

In result, the correlation between case and connectivity attested in Moksha relative clauses is not the one found elsewhere in movement dependencies. This implies that in order to derive both types of relative clauses in Moksha via raising, one needs to ensue a relation between case and connectivity, which, first, does not independently follow from properties of the model (as already noted earlier) and, second, is not attested in other instances of movement. Whatever a mechanism that would derive such a correlation would be, it is then inevitably at risk of being a construction-specific rule.

Lastly, let's apply to relatives in Moksha an existing mechanism that can derive some type of dependency between case and connectivity: the Wholesale late merge. According to Takahashi & Hulsey (2009), one of the conditions on its application is that noun phrases cannot be late-merged in positions higher than where they must get case. Note that the resulting correlation is not the one required in Moksha: Nothing precludes nouns from merging below their case positions, so that heads with the external case are not required to be exempt from binding or forming an idiom in the relative CP. Furthermore, the operation of Wholesale late merger is not straightforwardly applicable to heads of relative clauses, because it requires the D head corresponding to the late merged noun to be present in the base position, so that the noun can be then late merged to it. Under the raising derivation, the D head that the head noun is a constituent with in the final structure is always merged external to the relative CP. Finally, it is unclear whether the approach still qualifies as raising if the head noun is late merged outside of the relative CP and was in fact never present in the gap position inside the relative CP.

Matching and matching only

Since the matching derivation is not involved in the proposed analysis, in this section I will consider whether it can derive one of the relative clause types in Moksha or even both of them.

Let's start with a scenario where matching derives relative clauses with an external case and co-exists in grammar with another derivation (e.g., raising) for relative clauses with the internal case. The external case marking follows from the obligatory realization of the external head and the PF-deletion of the internal head. An analysis of the corresponding interpretative effects depends on assumptions about the behavior of the two heads at LF. The version of the matching approach that allows to (sometimes exceptionally) delete one of the heads at LF (see Munn (1994), Citko (2001), and Salzmann (2017, 2018)) does not exclude connectivity with the position inside the relative CP: The internal head can be interpreted and the external one can be deleted at LF, which predicts that in relatives with the external case idioms or binding in the relative CP is possible due to the interpretation of the internal head. It

might be, however, possible for this version of matching to derive the data if the head that is deleted at LF must be the same as the one deleted at PF. For now, I would like to point out that it is not straightforward how a correspondence between deletion at LF and PF could be ensured and that such an assumption would contradict previous applications of the matching derivation. Such an approach also needs to delegate all the connectivity effects to the LF, which is problematic for the anaphor binding, as I have pointed out earlier in the discussion of the analysis by Sportiche (2017) and will articulate again in the end of this section.

Matching approaches that require to interpret both instances of the head noun (see Sauerland (1998, 2003)) yield a better result: An obligatory presence of the external head at LF excludes idioms and binding in the relative CP, but can still allow for the condition C obviation if vehicle change is used. This version of the matching analysis however does not account for idioms in the main clause. If both heads must be present at LF and contain a part of an idiom that is licensed only in the main clause, the interpretation of the internal head must lead to ungrammaticality. One way to approach this is to weaken the condition for identity between the two heads, so that the internal head does not have to include a part of an idiom, but some semantically similar phrase is sufficient. While this option is envisaged in a footnote by Bhatt (2002), an actual analysis was never formulated and it still remains to be shown that this general idea can be implemented, so that it does not overgenerate idiomatic interpretation and binding of internal heads that now do not have to be identical to the realized external ones. Note also that the deletion at PF should then apply without lexical identity between the two heads.

Next, let's turn to a scenario where matching derives relative clauses with an internal case marking and co-exists with yet another derivation (e.g., the head-external one) for relatives with an external case. As was shown in section 3.2.2, matching can derive internal case marking on the head noun if the internal head is realized and the external head is deleted (see Cinque (2015, 2020) and Wood et al. (2017)). The overt realization of an internal head immediately leads to further complications. Heads with the internal case in Moksha linearly precede relative pronouns that also have an internal case marking and are first merged in the gap position, where they form a constituent with the head noun as illustrated in (110a). To derive the correct linear order between the head and the relative pronoun, the head must further move across the relative pronoun; see (110b).

(110) a. $[_{CP}\ C \ldots [_{DPrel}\ \underline{\text{rel.pron head}}\ ] \ldots]$

b. $[\ \underline{\text{head}}\ [_{CP}\ [_{DPrel}\ \text{rel.pron-}\alpha\ \_\_\text{head}\ ]\ C_{rel} \ldots \_\_\text{DPrel} \ldots]\ ]$

In result, to derive relatives with ICA, matching derivation must essentially include the raising derivation as its proper subpart. The matters complicate further once we

try to incorporate into this derivation the conclusion of chapter 2 that heads with the internal case move out of relative CPs and occupy the regular argument position in the main clause. This practically leaves no position where the external head could be merged.

The corresponding connectivity effects also do not follow for free. Under the version of matching where both heads are preserved at LF, the presence of the external head does not allow attested connectivity with the relative clause internal position. The version of matching where one of the heads can be deleted at LF does not exclude the interpretation of the external head, which would give raise to the connectivity with the main clause material. As mentioned earlier, the approach with deletion of one head at LF seems promising for capturing connectivity effects only if it can be ensured that the same head is deleted at both PF and LF. Again, I will return to this option momentarily.

Finally, suppose that matching is the only analysis and it must capture both types of relative clauses in Moksha. PF-deletion of the internal head then underlies relatives with external case, PF-deletion of the external head gives rise to relatives with ICA, and the connectivity effects follow, because in Moksha (unlike in other languages) the head that is pronounced at PF is also the one interpreted at LF. Such an approach encounters a number of problems. Most of them were mentioned earlier, but I will briefly list them here. First, the realized internal head moves across the relative pronoun, so that the matching properly includes the raising derivation and given the final landing site of the head noun in the main clause leaves no place for the external head. Second, it is unclear how simultaneous deletion at LF and PF can be ensured. One known case of non-realization at PF is ellipsis and it does not force deletion at LF as well. Third, the approach requires all connectivity effect to take place at LF which is at odds with properties of reflexive binding that is usually assumed to apply throughout the derivation. In particular, if the external head must be deleted at LF in relatives with ICA and all connectivity effects apply at LF, the approach cannot derive anaphor binding by the main clause material and does not allow the head with the internal case to bind further material in the main clause, contrary to the facts.

3.5 Conclusion and outlook

On the basis of the novel empirical data on the relation between case of the head noun and connectivity, I have argued that relatives with ICA are best derived by raising. Raising must be, thus, a part of natural language syntax. I have also shown that relatives with external case marking have different properties and have argued that they are derived by the head-external structure. In result, the two types of syntactic generation for relative clauses co-exist in one language.

While I hope the reader is by now convinced that this is the correct analysis

for relative clauses in Moksha, a bigger and potentially more relevant question to ask is whether the co-existence of the raising and the head-external analyses can be successfully extended to other languages and is the correct account of the externally-headed relative clauses cross-linguistically. In what follows I will list the four most notable problems for such a view. One of them will be resolved in the next chapter, two here, and for the final one, I will show that matters are at least more controversial than originally suggested.

First, while the raising derivation has been proven to be successful in deriving various attested phenomena, it was also extensively criticized, for instance, for producing an incorrect phrase structure for a noun phrase and an absence of a clear trigger for the final movement of the head noun; see Borsley (1997) and also Salzmann (2014, 2017) for a recent overview.

These problems are most recently raised by Pankau (2018). He demonstrates that the movement of the head to the main clause is required for raising to derive the data on antipronominal contexts in German, i.e., contexts where a full noun phrase is required (see (111a)). The data show that both the relativized position and the position of the head in the main clause can be in the antipronominal environments at the same time; see (111b).

(111) a. Er kommt / stammt [**aus diesem Land**] / *aus ihm.
he comes descends out this country out it
'He comes/descends from that country / *from it.' (Pankau 2018: 194)

b. Ich komme [**aus dem Land**], [**aus dem** __] der verstorbene Papst
I come out the country out which the deceased pope
stammt.
descends
'I come from the country that the deceased pope comes from.'
(Pankau 2018: 203)

Pankau (2018) concurs that the data can be accounted for by the raising derivation if the head noun moves from the relativized position to the argument position in the main clause so that the requirement for the noun phrase in antipronominal environments is satisfied derivationally. Nevertheless, he rejects this account, because there is no satisfactory implementation for the final movement of the head noun, and concludes that the data are best derived by matching.

It was further noted that the simplest version of raising predicts the internal case marking on the head noun. While this is exactly what is attested in Moksha, this prediction is problematic for other languages. These and further problems of the raising derivation I will address in the next chapter, where I will spell out the syntax of raising. I will show that the issues related to the final movement of the head noun are resolved if the head noun selects for the relative CP itself and once the CP is build, probes upwards, moves, and projects in its landing site. Whether the head noun gets case in the relative CP or in the main clause can be modeled by different orderings of

case probes and other features on the head.

The second problem comes from the existence of the head-external derivation. Safir (1999) provides an argument (later repeated by Sauerland (1998), Bhatt (2002), and Sportiche (2017)) against this analysis being a part of natural language syntax. The argument is based on English data showing that a quantifier in the head noun cannot co-vary with a variable in the relative CP if this variable (or a noun phrase that contains it) c-commands the gap position. The data are given in (67)-(68) and repeated here.

(112) a. *[Pictures of anyone$_i$] which he$_i$ displays prominently are likely to be attractive ones.
b. [Pictures of anyone$_i$] which put him$_i$ in a good light are likely to be attractive ones.

(113) a. *?[Pictures of anyone$_i$] that his$_i$ agent likes are likely to be attractive.
b. [Pictures of anyone$_i$] that please his$_i$ agent are likely to be attractive. (Safir 1999: 611)

Safir (1999) claims that the ungrammaticality in (112a) and (113a) is due to crossover. The quantifier in the head noun moves across the co-indexed variable. This movement does not have to take place if the head-external derivation is available, because the head noun and thereby the quantifier could be simply first merged outside of the relative CP and crossover effects should be not triggered then, contrary to the facts. This problem will remain open for now. There are, though, some ways to approach it. For instance, it can be noted that there are in fact very few available data: Practically all existing English judgments come from Safir (1999) and Moksha does not show this correlation. Next, the most natural interpretation of the grammatical examples (112b) and (113b) is the one where *pictures*, i.e., the head noun presented by an operator inside the relative CP under the head-external analysis, also co-varies with the quantifier. In result, it might turn out that the head-external structure is ruled out here for an independent reason, but I leave this for a further research.

The third problem also comes from the existence of the head-external derivation and was recently raised by Sportiche (2017). He observes that there are restrictions on the relativized position inside the relative CP which directly follow if all relative clauses are derived by raising, but are surprising if raising co-exists with a derivation where the head of the relative clause and the position inside the relative CP are not related by movement. In particular, relying on English data, Sportiche (2017) shows that the relation between the head of the relative clause and the relativized position is sensitive to intervention by another noun phrase (see (114)), coordinate structure constraint (see (115)), as well as other island structures such as the complex noun phrase islands (see (116)).

(114) *The [$_{NP}$ summer] [the famous [$_{NP}$ storm during **which**] I remember ...]

(115) *The neighbor [because [of **whom** and (of) the doorman] I talked about the fight ...]

(116) a. *Any law [**which** you met the activist [who proposed _]]
b. *Any law [[the activist who proposed **which**] you met _]

I would like to suggest that the source for ungrammaticality in examples above is not the illegitimate movement of the head, but the position of the relative pronoun. Example (116a) is ungrammatical because the relative pronoun moves out of another relative CP thereby violating the complex NP constraint. In examples (114), (115), and (116b), the relative pronoun is in the general left periphery region of the relative clause, but not directly in its specifier. I suggest that insufficiently local relation between the relative pronoun and the C head leads to ungrammaticality. In general, these data then call for research on the limits of pied-piping in English, but do not provide an argument against the head-external derivation of relatives.

The fourth problem of extending the analysis proposed for Moksha to other languages deals with so-called conflicting requirements. Salzmann (2006, 2017, 2018) (see also Heck (2005)) notes that heads of relative clauses can show connectivity simultaneously with the position in the relative CP and in the main clause and argues that these data can be captured only under the matching analysis as it postulates two independent heads in the main and in the relative clause. While some types of conflicting requirements could be problematic for the current analysis, a careful consideration suggests that the existing examples are not. There are two types of examples.[19] Examples of the first type combine idiomatic interpretation in the relative clause and anaphor binding in the main clause as in (117).

(117) ... **he$_i$** showed me [the *picture* of **himself$_i$**] that one of my fellow students *took*. (Salzmann 2006: 42)

These data follow from the raising analysis: The head noun is base generated in the relative clause, forms an idiom there, and is then moved to the main clause where the anaphor is locally c-commanded by its binder. The data might be challenging if binding applies solely at LF and the head noun can be interpreted only in one of its positions, but are not problematic if anaphor binding applies in syntax.

The second type of conflicting requirements shows a combination of idiomatic interpretation in the main clause and pronominal binding in the relative clause; see (118) as well as German data presented by Heck (2005).

(118) I always try to *take* [*pictures* of **his$_i$** wife] that **every man$_i$** likes.

[19] Salzmann (2017: 157) also suggests in a footnote that the head noun can simultaneously form an idiom in the main and in the relative clause. Whether these data are problematic for the current analysis depends on the status of the used idiomatic expression. As we have seen in 3.3.1 above, in Moksha one of the considered idioms shows no correlation with respect to case for some speakers. If it turns out that some English idioms do not require to be base generated as a constituent, the data are not problematic.

(Salzmann 2006: 42)

Such examples are not problematic as well because one of the connectivity effects involves pronominal binding, a diagnostic that was argued to be highly unreliable in this chapter. I suggest that this example instantiates the head-external structure: It allows the head noun to form an idiom with the main clause material. The personal pronoun must then receive an bound interpretation without being c-commanded by a quantified noun phrase. While I do not articulate the mechanism that allows this, these data illustrate one of numerous cases where a pronoun that has never been a part of the relative clause can be bound by a variable inside the relative CP (see 3.3.3 above).

Chapter 4

Analysis

4.1 Introduction

In the previous two chapters I have investigated the properties of relative clauses with ICA in Moksha. I have shown that relative clauses with ICA belong to the externally-headed relative clauses and their main differences from the regular externally-headed relatives are the internal case marking on the head noun and the position of the relative clause on the left periphery. I have argued that the internal case is due the raising derivation that underlies relative clauses with ICA. Under this derivation, the head of the relative clause first merges inside the relative CP and then moves to an argument position in the main clause. I have also shown that the position of the relative clause on the left periphery is a derived one; that is, the noun phrase that includes the relative clause with ICA starts in the argument position in the main clause, but is obligatorily displaced to the left in the course of the derivation.

In this chapter, I will present the analysis of relative clauses with ICA in Moksha. I start with the formal implementation of the raising derivation, which remains a subject of an extensive debate. The main problem comes from the final movement of the head across the relative pronoun that does not have a clear trigger and as was argued in chapter 2 does not land in a specifier position, but must proceed, so that the part of the noun phrase that moves out of the relative CP must be directly in the complement of the CP-external higher nominal projections, that is the structure of the noun phrase in the head of the relative CP must be the same as the regular noun phrase structure.

I propose that problems raised by the movement of the head are resolved if Merge is feature-driven, projection is determined by selection (see Chomsky (1995b), Adger (2003) as well as Stabler (1997)), and Minimal Search applies upwards as well as downwards (see Wurmbrand (2012), Zeijlstra (2012), Bjorkman & Zeijlstra (2019), i.a.). In particular, I suggest that heads of relative clauses themselves select for relative CPs. Being first merged in the relativized position, they probe upwards, find the relative CP once it is built, merge with it, and project in the final landing site. The projecting movement of the head noun is thus triggered by the feature on the head itself (cf. a

concept of Münchhausen features introduced by Fanselow (2003)). The head noun may receive its case before movement thereby deriving the relatives with ICA or after the movement in the main clause thereby deriving raising relatives with the external case attested in most languages. The position of case assignment is determined by the respective ordering of the case probe and the merge feature responsible for the final movement of the head noun.

I further suggest that feature-driven Merge and projection by selection labeling algorithm underlie the account of the left-peripheral position of the relatives with ICA. The obligatory movement to the left belongs to the group of phenomena that I will call forced ex-situ effects. They encompass cases where some syntactic configuration is legitimate at an intermediate stage of the derivation, but must be destroyed before the derivation terminates. I propose that forced ex-situ effects are best derived if merge features are enriched with the second order subfeatures, i.e., selection applies not only for the category, but also for active syntactic features of a selected syntactic object. The left-peripheral position of relatives with ICA then arises, because heads in the main clause typically select for DPs with a further unsatisfied feature. The role of this unsatisfied feature can be fulfilled by an unvalued case feature, but heads of relatives with ICA have their case feature valued in the relative CP and in order to satisfy the selection requirements in the main clause, they must have a further active feature that then enforces movement of the relative clause to the left.

After the main properties (internal case marking and left-peripheral position) of relative clauses with ICA are derived, I turn to other attested properties of this relativization strategy in Moksha: a ban on extraposition, extraction out of the relative clause, a possibility of an appositive interpretation, and mismatches in case markings of the head and the relative pronoun. I will show that they largely follow from the proposed analysis of relatives with ICA, sometimes accompanied with assumptions on the corresponding phenomena.

Apart from deriving the data of one specific language and suggesting a novel implementation of the raising syntax, the analysis has the following general implications: First, I use a model where Merge is feature-driven and projection by selection labeling algorithm and show that it can derive non-trivial syntactic patterns such as projecting movement and forced ex-situ effects. The latter effects are also known under the term local instability (see Ott (2012, 2015)).[20] They constitute one of the empirical arguments against at some point default, but nowadays often rejected projection by selection approach to labeling and in favor of the novel labeling algorithm developed by Chomsky (2013, 2015). I will show that this novel labeling algorithm does not derive the forced ex-situ in Moksha and this research thus provides an argument again it. Second, the proposed analysis relies on ordered feature stacks and once again shows that a language specific fixing of an initially indeterminate

[20] I do not adopt the term local instability as a name of the pattern, because it presupposes a specific analysis and appears to be misleading: The relevant configurations are in fact stable *locally*, but not globally.

order of elementary operations may underlie parametrization (see Georgi (2017) and Murphy & Puškar (2018)). It also shows that ordering of features allows derive a delayed application of syntactic operations that everything being equal could apply earlier in the derivation. Some of these implications will be further investigated in the next chapter.

In this chapter, I will proceed as follows. In section 4.2, I start with reviewing the syntax of raising, then present my version of the raising derivation, and show how the internal or external case marking on the head are derived. In section 4.3, I present the analysis of the left periphery requirement and then derive further properties of relatives with ICA in Moksha in section 4.4. Section 4.5 concludes.

4.2 Syntax of raising

4.2.1 Review

Investigating the syntax of relatives with ICA in chapters 2 and 3, I came to the following conclusions: First, the head of the relative clause with ICA is base merged inside the relative CP in the relativization position as shown in (1a). Second, the final position of the head is in the main clause in the complement of the relative clause external nominal projections; see (1b). Third, the two positions of the head in (1a) and (1b) are related by movement and there are no other instances of the head in the structure.

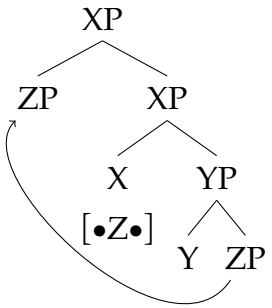
(1) a. First merge position of the head
[$_{\text{CPrel}}$ C_{rel} ... [$_{\text{DPrel}}$ rel.pron NP_{head}] ...]
b. Final position of the head
[$_{\text{DP}}$ D [$_{\text{NP}}$ NP_{head} [$_{\text{CPrel}}$ rel.pron C_{rel} ...]]]

The first and the last of these requirements are fulfilled by the raising derivation. In this subsection, I will review existing implementations of raising and show that they either do not fulfill the second requirement or significantly complicate the system to derive it.

As already discussed in section 2.4.2, the final position of the head is in the specifier position under most implementations of the raising derivation. This can be a specifier position in the relative CP (see Kayne (1994), Bianchi (1999), and De Vries (2002)) or a specifier of some nominal projection outside of the relative CP (see Bhatt (2002) and Deal (2016)). This widely assumed position of the head in the specifier is determined by the standard implementation of movement, under which it is triggered by a feature on a higher syntactic head and this head then provides a label for a newly created constituent after movement. A moved syntactic object naturally appears in the specifier position; see (2). Here are throughout this work I use the notation introduced by Heck & Müller (2007), according to which probe features are

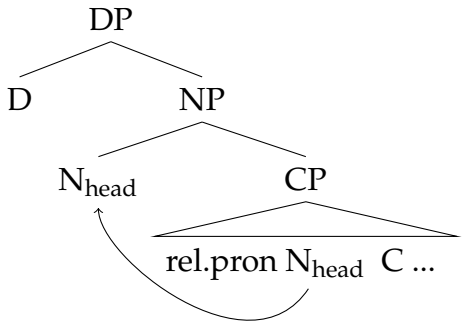
indicated as [∗F∗] and merge/selection features as [•F•].

(2) Standard movement to the specifier



Placement of the head noun in the specifier does not provide the regular noun phrase structure for the head DP and I therefore reject the implementations of raising listed above. What seems to be required instead is so-called projecting movement: Before movement of the head the relevant chunk of syntactic structure is the relative CP, but after the movement it can further participate in the derivation as a noun. It is thus the movement of the head that somehow turns the relative CP into the DP. The concept of projecting movement is straightforwardly implemented in the analysis envisaged by Donati (2006) and developed in (Donati & Cecchetto 2011, Cecchetto & Donati 2016). This approach relies on one of the core ideas of Chomsky's recent labeling algorithm (see Chomsky (2013)) that heads always project. Heads are here understood as syntactic terminals modulo complex structures created by head movement (see Rizzi (2016)). Under this analysis, heads of relative clauses can indeed provide a label for a newly created constituent in their landing site, but they must be syntactic terminals; see (3).

(3) Projecting movement of N (Donati & Cecchetto 2011, Cecchetto & Donati 2016)



This approach does not capture the data of relatives with ICA in Moksha, because they require the nominal constituent that moves out of the relative CP to be branching, not atomic. This might seem confusing given the terminological tradition of calling it the *head* of the relative clause, but this term reflects that the constituent *heads* the relative

CP, but does not mean that it must be a terminal. One piece of evidence showing that the nominal constituent moving out of the relative CP must be branching comes from binding of anaphors and is presented in the example repeated here as (4). The noun in the head of this relative clause is marked for the internal case, which indicates the underlying raising derivation. The noun is accompanied by the reflexive pronoun that is bound in the relative CP and thus must also move from the relative clause internal position, showing that the movement of the terminal N node is inadequate.

(4) NOM ← DAT
Es'$_i$ luv-ij-ənzə-**n'd'i** [kona-t'n'ə-n'd'i t'ɛ
self read-PTCP.ACT-3SG.POSS.PL-DAT which-DEF.PL-DAT this
kn'iga-s'$_i$ maks-i nad'əja-ma] uč-ij̊-t' pe.
book-DEF.SG[NOM] 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.'

While the argument for phrasal, not terminal movement in raising derivation is in Moksha strengthened by the internal case marking on the head noun, comparable evidence is attested in a number of languages. Donati & Cecchetto (2011) acknowledge the problem but suggest that all the evidence demonstrating that a constituent larger than the terminal N node moves to the main clause is a fallacy based on incorrect analyses of underlying processes. For instance, anaphor binding as in (4) is possible, because PRO occupies the position of the external argument. This and other potential re-analysis of the anaphor binding are discussed in detail and excluded in the previous chapter in section 3.3.2.[21]

The account developed by Donati & Cecchetto (2011) also does not provide a clear trigger for the movement of the head noun. The earlier work, Donati & Cecchetto (2011), propose sthat the D head can probe for the N head from the numeration before this D head enters the derivation, while later, in Cecchetto & Donati (2016), the free Merge approach is embraced, so that movement does not have or need a trigger.

Yet another implementation of the raising derivation was developed by Henderson (2007). Relying on the concept of sideward movement (see Nunes (2001, 2004)), he suggests that after the movement of the relativized constituent to Spec,CP, the head is copied to the workspace, and then this copy merges with the external D. In the end, the relative CP is countercyclically late-adjoined to the NP. The derivation is illustrated in (5).

(5) a. Relative CP after CP-internal movement

$[_{\text{CPrel}}\ \text{NP}_{\text{head}}\ \text{C}\ \ldots\ ]$

b. Copy the head to the workspace

$[_{\text{CPrel}}\ \overline{\text{NP}_{\text{head}}}\ \text{C}\ \ldots\ ]$ $\qquad\qquad$ NP_{head}

[21] Note that by arguing away the evidence that relies on modifiers accompanying the noun, Donati & Cecchetto are eliminating the vast majority of arguments for the raising derivation in the first place. This seems to be an unwelcome consequence for an implementation of raising.

c. Merge with the external D

$[_{\text{CPrel}}\ \overline{\text{NP}_{\text{head}}}\ \text{C} \ldots]$ $\qquad$ $[_{\text{DP}}\ \text{D}\ \text{NP}_{\text{head}}\ ]$

d. Late adjunction of the relative CP

$[\ [_{\text{DP}}\ \text{D}\ [_{\text{NP}}\ [_{\text{NP}}\ \text{NP}_{\text{head}}\ ]\ [_{\text{CPrel}}\ \overline{\text{NP}_{\text{head}}}\ \text{C} \ldots]\ ]\ ]$

A clear advantage of this implementation is that the head of the relative clause has the regular noun phrase structure, but this comes at the cost of enriching the model with cross-derivational probing and movement. The analysis also requires an obligatory countercyclic late adjunction of the relative CP to the head. Henderson (2007) suggests that the late adjunction of the relative CP is necessary, because it derives Condition C obviation effects reported by Lebeaux (1988, 1990). First, while the late merge of a relative CP might be required in some contexts, it is hardly necessary across-the-board. Second, all known cases of late merge apply when the host for a late merged constituent is moved, which is not the case under this analysis. As shown by Sportiche (2019), the application of late merge without displacement of the target leads to unsolicited empirical consequences. I will address late merge and discuss how it can be derived without overgeneration in chapter 5.

4.2.2 Proposal

I suggest that the correct structure for the raising relative clauses is best derived if the projecting movement of the head noun is taken at face value: The head of the relative clause moves from a position in the relative clause, merges with the relative CP, and projects in the landing site. The displaced constituent can be branching (unlike in the otherwise similar analysis by Donati & Cecchetto (2011)).

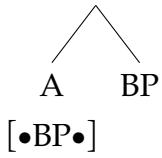
A possibility for a displaced syntactic object to project in its landing site arises under the projection by selection model if movement is triggered by a feature on a displaced syntactic object. Projection by selection is a labeling algorithm,[22] according to which a label for a newly created syntactic object is determined by features of the two merged syntactic objects, so that the one that bears a feature triggering this Merge operation provides a label (see Chomsky (1995b), Adger (2003) as well as Stabler (1997)). The algorithm is often defined by the slogan in (6).

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

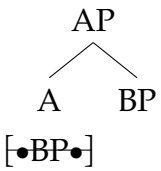
The derivation below illustrates this labeling algorithm: In (7), A has an unchecked selectional feature that triggers Merge with BP and A also provides a label for a newly created syntactic object in (8).

[22] I use terms projection and labeling as mutually interchangeable. I spell out my assumptions in more detail in section 4.2.4.

(7) Merge

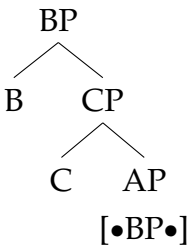


(8) Labeling

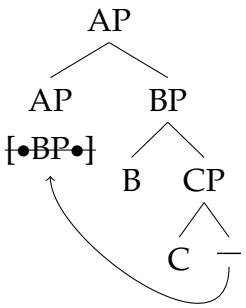


Projecting movement follows if a displaced syntactic object has a selection feature and triggers Merge itself, which is in turn possible if the search applies upwards as well (see Baker (2008), Wurmbrand (2012), Zeijlstra (2012), Himmelreich (2017), and Bjorkman & Zeijlstra (2019), i.a.). In this case, a selection feature on a syntactic object that is embedded deeper in the structure may search upwards and target syntactic objects that are built only later in the derivation. Consider the sample derivation in (9)-(10): AP selects for BP and moves upwards to merge with it after BP enters the derivation. As the movement is triggered by the selection feature on AP, it also projects a label in accordance with (6).

(9) Base position



(10) Movement and projection



Raising relative clauses have then the following derivation. They start with the numeration in (11) that among other syntactic objects obligatorily contains NP with a [•CP•] selection feature, the relative D (i.e., the relative pronoun or operator) with a [•NP•] feature, and the relative C head.[23] The relative C selects for a TP that in turn must contain a syntactic object that selects for a DP head of the relative clause in this derivation. This syntactic object is a V head and that the relative DP is a direct object here.

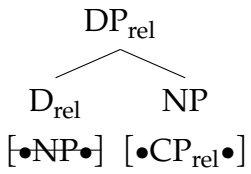
(11) Numeration for raising relative clauses (version 1):

[23]Here and in what follows, I identify the constituent that moves out of the relative clause as the NP. At the same time, examples in chapter 3 show that it can contain a possessor. I will not delve into the noun phrase structure, but assume that possessors are in the Spec,NP. Shall some further research demonstrate that possessors are in a separate functional projection, the constituent moving out of the relative CP must be then a PossP, but the rest of the analysis remains the same.

$$\{ \begin{bmatrix} C_{rel} \\ \bullet TP \bullet \\ \bullet DP_{rel} \bullet \end{bmatrix}, \dots, \begin{bmatrix} V \\ \bullet DP \bullet \\ \dots \end{bmatrix}, \begin{bmatrix} D_{rel} \\ \bullet NP \bullet \\ \dots \end{bmatrix}, \begin{bmatrix} N \\ \dots \\ \bullet CP_{rel} \bullet \\ \dots \end{bmatrix}, \dots \}$$

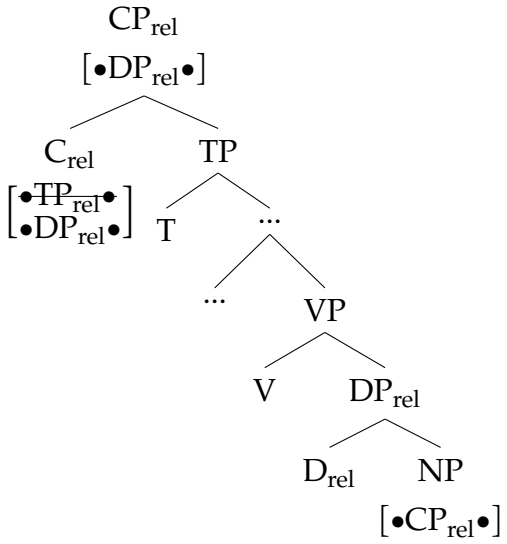
In (11), the relative C head by transitivity ultimately selects the head NP, but the head NP also has a selection feature for the relative CP. Given the possibility of upward probing, such a numeration can lead to a well-formed derivation if one of the syntactic objects is itself selected while its merge feature is still active. It then moves upwards to satisfy this active merge feature. In the derivation of raising relative clauses, the head NP must merge with the relative D head before saturating its own [•CP_{rel}•] merge feature; see (12).

(12) Relative DP



After this, the derivation proceeds in a regular way until the relative C head is merged; see (13). For the sake of simplicity, I ignore possible intermediate movement steps that the relative DP may undergo to get case or escape the spell-out of lower phases in the relative clause.

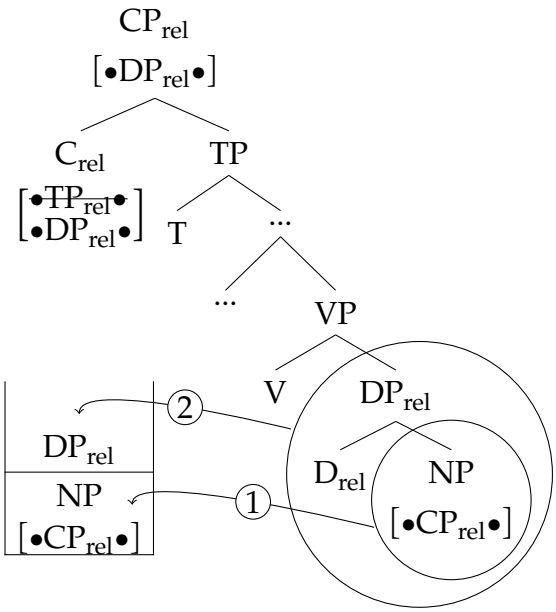
(13) Relative CP



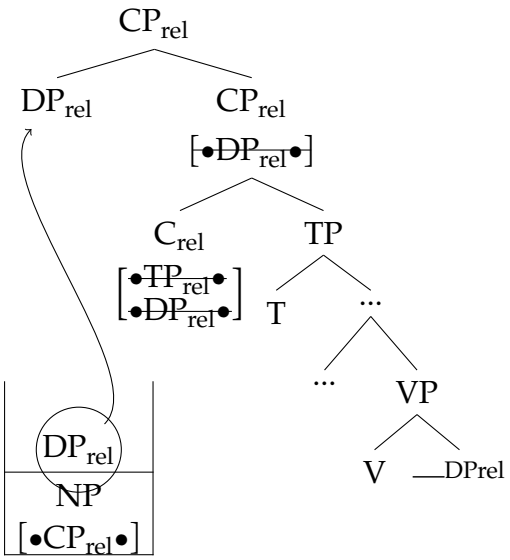
After Merge of C_{rel}, there are two unordered active selection features that have both located their goals: [•DP_{rel}•] on the relative C that is responsible for the movement of the relative pronoun to the left periphery of the relative CP and [•CP_{rel}•] on the head NP that located its goal by upward search and needs to move upwards to merge with the relative CP. I suggest that copies of the two syntactic objects that are to be displaced are then subsequently created and merged to the workspace. Following

Heck (2016), Heck & Himmelreich (2017), I assume that copies are organized in a stack, similarly to features on the heads. This means that the copy that is created first appears on the bottom of the stack structure and therefore must be merged back to the derivation as the last one. The structure (14) illustrates the scenario where the head NP is copied and placed in the stack first. The copy of the relative DP is created in the next step: It then precedes the head NP in the stack and must be merged in the structure, before the head NP can do so; see (15).

(14) Search and copying

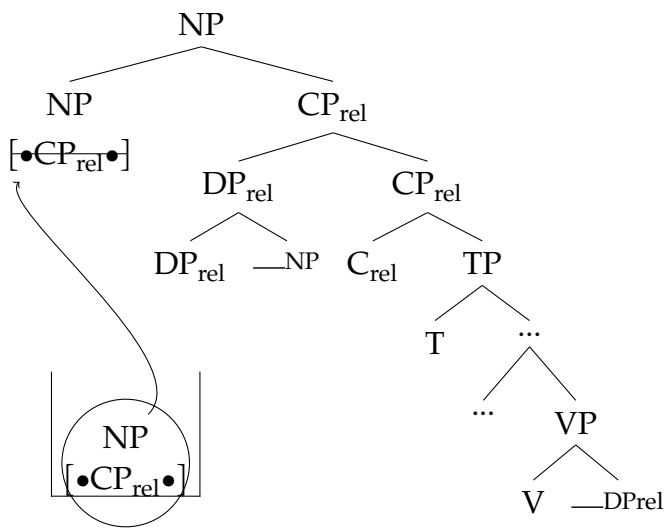


(15) Merge of DP_{rel}



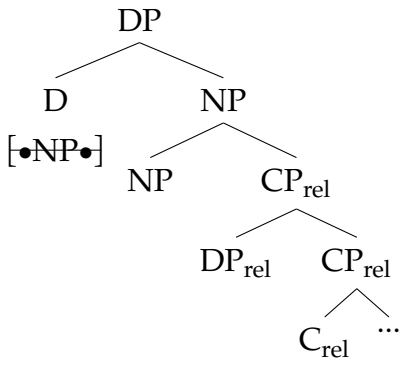
In (16), the head NP merges with the relative CP and checks its selection feature. As Merge is triggered by the feature on the NP itself, it also projects in the landing site giving rise to the projecting movement.

(16) Merge of the head NP



After this, the NP modified by the relative clause is selected by the external D head and merges with it. The created DP is then subsequently selected by the main clause material.

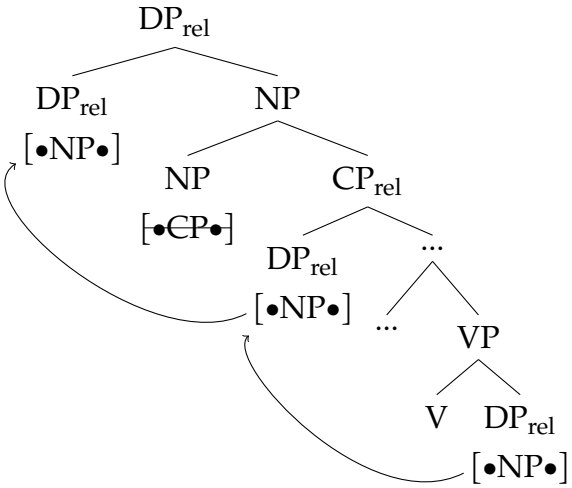
(17) Merge of the external D head



The derivation above has two steps where its course is not a priori determined by the principles of the grammar articulated so far. First, the numeration in (11) contains two heads that by transitivity ultimately select each other and thereby require one of them to be selected before its own selection features are checked. Nothing indicates that this must the NP (not relative DP or CP) that is selected before all its selection features are checked. Second, when the relative C head is merged and two selection features ([•DP$_{rel}$•] on the C head and [•CP$_{rel}$•] on the NP) find their goals, no principle requires for a copy of the NP to be created and put to the stack first.

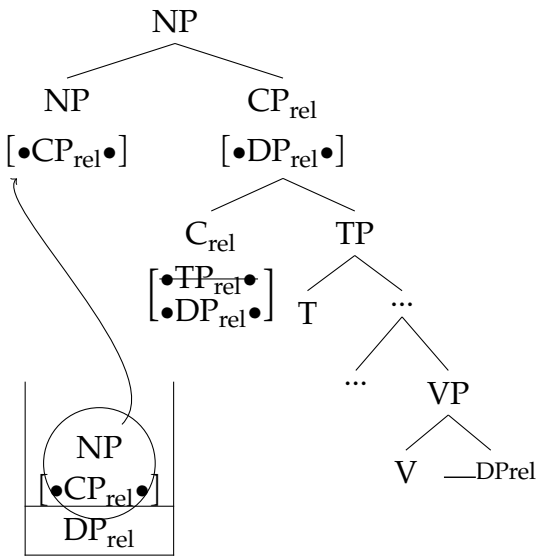
There are two ways to approach such indeterminacy in the derivation. On the one hand, it can be shown for both cases that none of the alternative derivations converges; that is, allows emptying the numeration and satisfy the active features on syntactic objects. Let's consider one of such derivations. Suppose that it is the relative DP that is selected before its own merge features are checked, i.e., the head NP is merged only later. In this case, the relative D will move upwards and project later in the derivation; see (18). The external D head however searches for an NP and the derivation therefore either cannot proceed, or if the formed DP can be selected by the main clause material, the external D head cannot merge. I do not go through all possible derivations here, but they lead to an analogous result.

(18) Merge of D_{rel} with the unchecked selection feature



I will now turn to the second indeterminacy in the proposed implementation of raising. Similarly to a previous case, it can be shown that the alternatives fail: If it is the relative DP, not the NP that is copied first, then the NP will be re-introduced in the derivation first, and as it projects, C will be not at the root after this as shown in (19). The Merge of the relative DP necessary to satisfy the selection features on C can then be only countercyclic and is therefore excluded by the Strict Cycle Condition (see Chomsky (1973, 1995b, 2019)).

(19) Merge of NP before DP_{rel}



As a result, it can be concluded that no grammatical principle requires the derivation to follow alternative paths shown above and it can in fact proceed differently, but inevitably crashes in that case. However, such an approach seems to undermine

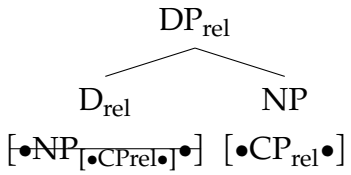
the general idea of highly deterministic (though not necessarily crash-proof) syntax where all operations are feature-driven and features are ordered in stacks. I will therefore pursue a different view here. First, I suggest that the relative pronoun D_{rel} in fact selects for an NP with the unchecked [•CP•] feature; that is, selection applies not only for the category, but also for further active features of the syntactic object. I will elaborate on the possibility of such second order selection features in section 4.3.

(20) Numeration for raising relative clauses (version 2):

$$\{ \begin{bmatrix} C_{rel} \\ \bullet TP \bullet \\ \bullet DP_{rel} \bullet \end{bmatrix}, \dots, \begin{bmatrix} V \\ \bullet DP \bullet \\ \dots \end{bmatrix}, \begin{bmatrix} D_{rel} \\ \bullet NP_{[\bullet CPrel \bullet]} \bullet \\ \dots \end{bmatrix}, \begin{bmatrix} N \\ \dots \\ \bullet CP_{rel} \bullet \\ \dots \end{bmatrix}, \dots \}$$

The modified numeration that derives raising relative clauses is given in (21). The feature $[\bullet NP_{[\bullet CPrel \bullet]} \bullet]$ on the D_{rel} ensures that NP cannot be merged with CP_{rel} before it is selected by D_{rel}. The first step where the relative D is merged with the NP is shown in (22).[24]

(21) Relative DP



Second, for the later step of the derivation, when the two copies must be created (see (14)), I suggest that the order is determined by the preference for the upward search: In rare cases, where there are two unchecked selection features that are not ordered and have both found their goals, the upward search is given precedence over the downward search (cf. Assmann, Georgi, Heck, Müller, & Weisser (2015) and Bjorkman & Zeijlstra (2019)). This ensures that the head NP is copied first.

4.2.3 Inverse case attraction

With the analysis of raising relative clauses in hand, I will now turn to the cross-linguistic differences in the case marking on the head: In chapter 3 (see section 3.4 in particular), I have argued that relative clauses with ICA in Moksha are derived by raising and differ from raising relatives in a vast majority of languages (see, e.g., German or Russian) in that the head bears the case assigned in the relative CP. The phenomenon is again shown in example (22), where the head is marked for the genitive (the regular direct object case in Moksha) instead of the dative expected

[24] Additional empirical support showing that relative pronouns select for noun phrases with a yet unchecked $[\bullet CP_{rel} \bullet]$ feature comes from relative pronouns that cannot form a constituent with a noun in the resulting structure; cf. *the boy who was late*, but **Who boy was late?* (Aoun & Li 2003, Heck 2005, Salzmann 2014). I will return to these data and provide further evidence for the second order selection feature on the relative pronoun in chapter 5.

according to the indirect object position of the head in the main clause.

(22) DAT ← GEN
Pin'ə-**t'** [kona-n' Pet'ɛ rama-z'ə] mon
dog-DEF.SG.GEN which-GEN Petja[NOM] buy-PST.3SG.O.3SG.S I[NOM]
maks-an jarca-ma.
give-NPST.1SG eat-NZR
'I am giving food to the dog that Petja bought.'

Besides Moksha, such internal case marking of the head is attested in a number of languages; see Ancient Greek (Grimm (2005: 78-92)), Latin (Touratier (1980: 147-211)), Vedic and Sanskrit (Gonda (1975: 195)), Middle High German (Pittner (1995)), non-standard Icelandic (Wood et al. (2017)), Besermyan Udmurt (Belyaev (2012), Kholodilova & Privizentseva (2015)), Ingrian Finnish (Kholodilova (2013)), Nez Perce (Deal (2016)), and Koryak (Abramovitz (2021)) among others.

Examples (23)-(24) come from languages without ICA. They illustrate the external case marking on the head in relatives that show connectivity with the position in the relative CP and are therefore also derived by raising. In particular, example (23) from German shows anaphor binding into the head by relative CP internal material.

(23) Der Wesenszug von **sich$_i$**, [den **Peter$_i$** noch nicht __
the.NOM trait of self which.ACC Peter still not
kannte], störte niemanden.
know.PST.3SG annoy.PST.3SG no.one.ACC
'No one was annoyed by the side of himself$_i$ that Peter$_i$ did not know yet.'
(Salzmann 2006: 99)

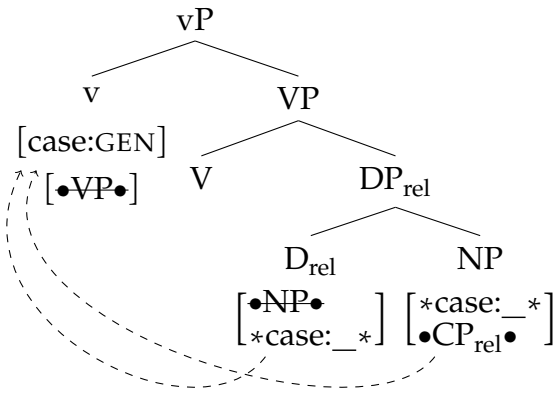
Example (25) from Russian contains the idiom *vešat' lapšu na uši* 'to tell lies (lit. to hang noodles on the ears)'. The idiom is split between the head and the material inside the relative CP.

(24) **Lapša**, [kotoruju nam **vešaet na uši** pravitel'stvo], mešaet
noodles.NOM which.ACC us hangs on ears government obstructs
vsem.
all
'Lies that the government tells us obstructs everyone.'
(based on (Lyutikova 2015: 6))

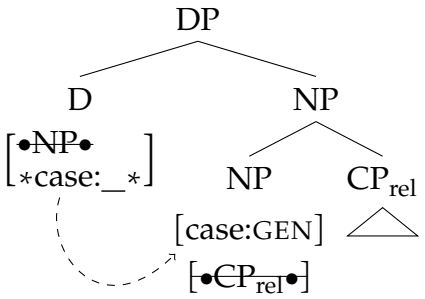
I suggest that different orderings of the [•CP$_{rel}$•] merge feature and a case probe on the head NP underlie the difference in case marking. In languages with internal case, the case probe is ordered before the merge feature and thus requires the case to be assigned inside the relative CP. This is shown in (25), where the head occupies the direct object position in the relative CP (as in (22)) and gets the genitive case from *v*. I assume that both the relative pronoun and the noun have case probes in Moksha and receive case via Agree. The head NP moves to the main clause later in the derivation, but already has a valued case feature by then. I further suggest that

this valued case feature acts as a goal for the case probe on the external D head (if such a probe is present in a language); cf. Legate (2005) on cyclic agreement. The probe on D finds the valued case feature on the noun and agrees with it before higher clausal projections that are usually targeted by the case probe enter the derivation (see (26)).

(25) Internal case: In the relative CP

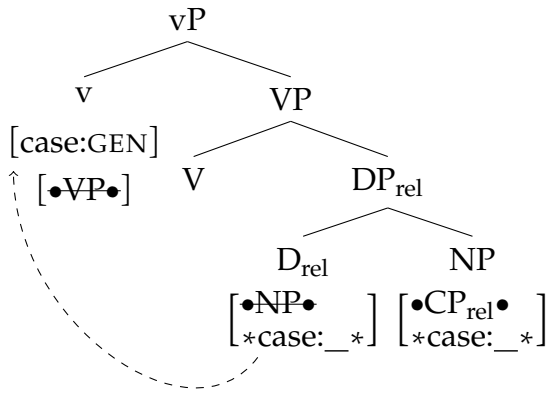


(26) Internal case: In the main clause

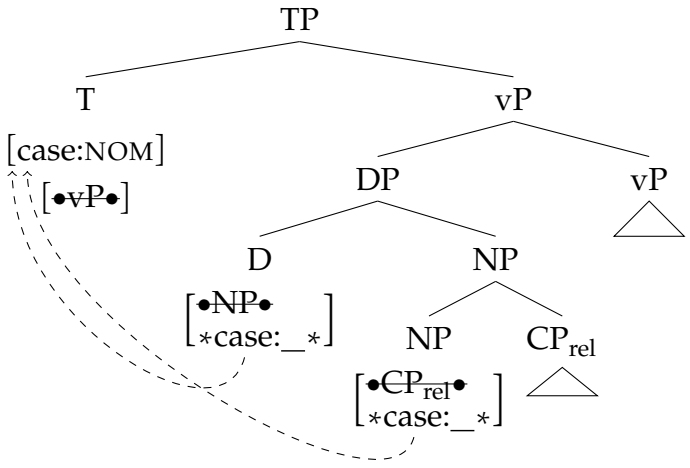


In languages with the external case, the case probe is ordered after the [•CP$_{rel}$•] merge feature and therefore can probe only after the merge feature is checked; i.e., after movement of the head to the main clause; see (27)-(28).

(27) External case: In the relative CP



(28) External case: In the main clause



Thus, the ordering of features allows postponing the valuation of a case feature even though in principle it could have been already satisfied at an earlier stage of the derivation. The two orderings and the resulting case markings are summarized in table (29).

(29) Case marking on the head under raising

Pattern	Ordered features on the N head
1. Internal case (Languages with ICA) *Latin, Moksha, Nez Perce etc.*	[∗case:_∗] < [•CP_{rel}•]
2. External case *German, Russian, Italian etc.*	[•CP_{rel}•] < [∗case:_∗]

To sum up, ordering the case probe before or after the merge feature that is checked upon movement of the head to the main clause determines whether the case feature is valued before or after this movement and derives raising with internal or external case respectively. This provides a novel perspective on one of the long-standing issues in the syntax of raising: Despite originating in a case position in the relative CP, the head shows a case assigned in the main clause in most languages (see Borsley (1997)). The current analysis accounts for a delayed valuation of a case feature by ordering the feature lower in the feature stack and thus shielding it from the probing at earlier stages. This approach seems to be also applicable to other case overwriting phenomena (see Bejar & Massam (1999), Merchant (2006), Potsdam (2006), Boeckx, Hornstein, & Nunes (2010), Fong (2019), i.a), but this remains a subject for further research.

4.2.4 Discussion

In this section, I will talk in more detail about the assumptions as well as implications of the proposed analysis. I start with the discussion of labeling and feature-driven Merge that underlie the approach. I will then turn to projecting movement and reasons why it was often rejected in the past. Finally, I will talk about yet another common criticism of the raising derivation and show how it can be addressed under the current account.

Merge and labeling

In deriving projecting movement, the analysis relies on projection by selection labeling algorithm. The integral part of this algorithm is that Merge is feature driven. Feature-driven Merge (and syntax, in general) is opposed to the idea of free Merge, according to which Merge (and possibly other syntactic operations) does not require a trigger, but its legitimacy is determined by various filters applying to the output representation. While the division between the feature-driven and free Merge fundamentally determines the shape of the syntactic theory, there are very few (if any) acknowledged differences in the empirical coverage of the two systems (see Müller (2017) for some suggestions). The choice between the approaches is therefore based on conceptual considerations: Chomsky (2013, 2015, 2019) argues that the free Merge

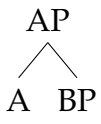
is superior, because it allows one to formulate the basic syntactic operation (i.e., Merge) in a maximally simple way. Another common argument is that despite being able to derive empirical data, postulation of formal features underlying Merge does not contribute to the explanatory depth of the theory. In fact, however, a model with feature-driven Merge turns out to be better articulated, while the one with free Merge essentially defers syntax to poorly developed representational filters, for which it still remains to be shown that they can derive basic syntactic phenomena in the absence of formal features such as those needed for the feature-driven Merge (see, e.g., Safir (2019) for the recent work on this).

The other question raised by the feature-driven Merge is its exact technical implementation. One option is that Merge is indeed directly triggered by merge features. The other one (cf. Collins (2002), Müller (2010), Zeijlstra (2020)) is that Merge per se is free after all, but there is a condition formulated for instance as in (30) that is checked after each Merge step.

(30) Merge condition:
Merge enables an immediate discharge of a categorial selection feature.

Both these options are viable in my view and the choice between them does not affect the current work. I will now turn to labeling. As mentioned in fn. 22, I use terms *labeling* and *projection* as mutually interchangeable and assume that they refer to an operation that determines features on the basis of which formed constituents are identified in the derivation. In the tree structures above, features selected as a label appear on the node immediately dominating merged objects (cf. Chomsky (1995a)). This is however a purely representational notation that is equivalent to the set-theoretic notation embraced in Chomsky (2013, 2015) (see also Seely (2006) for its criticism). The two equivalent notations are shown in (31) and (32). Following common conventions, I also distinguish between A and AP for indicating terminals versus branching constituents.

(31) Tree-theoretic notation



(32) Set-theoretic notation
{AP, { A, BP }

I further assume that at least the category and the active features of a syntactic object contribute to the label. This assumption is necessary for what I call second order selection features, i.e., the possibility to select not only for a category but also for other features of a target. So far, the second order selection feature was used in the derivation of relative clauses to ensure that the head NP enters the derivation with the unchecked selection feature. Second order selection features will also underlie

the analysis of the obligatory left peripheral position of relatives with ICA in Moksha (see section 4.3) and I will present further phenomena providing evidence for the necessity of second order selection features in the chapter 5.

Finally, projection by selection algorithm endorsed here is criticized for some empirical and conceptual reasons and competes with a number of alternative algorithms, most notably the non-deterministic labeling algorithm by Chomsky (2013, 2015) as well as the labelless syntax pursued by Collins (2002), exocentric labeling by Adger (2012), and feature percolation approach by Zeijlstra (2020). I will return to the main problems of projection by selection and review some of its alternatives later (see section 4.3 and chapter 5).

Projecting movement

The concept of projecting movement is not new for generative syntax: Projecting movement of terminals was sometimes used for deriving extended functional projections and head movement (see Pesetsky (1985), Ackema, Neeleman, & Weerman (1993), Haider (2000), Koeneman (2000), Bury (2003), Fanselow (2003), Surányi (2005), and Georgi & Müller (2010), Müller (2011), Börjesson & Müller (2020)). It was also proposed that wh-words can project upon their movement to the left periphery giving raise to free relative clauses (see Bury (2003), Donati (2006), Citko (2008b)) or even complement clauses (see Bayer & Brandner (2008)). Bhatt (2002) also envisages and discusses the possibility of projecting movement in headed relative clauses, but ultimately rejects this option due to complications with its technical implementation. In the majority of these proposals the projecting syntactic object is a terminal, but some proposals also allow for the projecting movement of a branching constituent (see Hornstein & Uriagereka (2002), Bury (2003), Georgi & Müller (2010), Sato (2010)). The motivation for the projection in the landing site is different across approaches: For instance, Donati (2006) suggests that the displaced syntactic object can project simply by virtue of being a head (cf. labeling algorithm proposed in Chomsky (2013, 2015)), while Fanselow (2003) (see also Surányi (2005) and Georgi & Müller (2010)) propose that the movement is triggered by features on a displaced syntactic object and this allows its projection in the landing site. Fanselow calls such movement a Münchhausen-style movement after the German literary character Baron Münchhausen who saved himself from drowning by pulling up on his own hair. My analysis of projecting movement also employs this idea that the movement is triggered by the features on the moved syntactic object and thus largely relies on this previous work, but extends it to a clear case of projecting movement for branching constituents.

While the idea of projecting movement was pursued in some work, it was also explicitly rejected by Chomsky (1995a,b) (see also Brody (1998)). There are at least three commonly discussed reasons why projecting movement was rejected in the late Government and Binding framework as well as in early Minimalism:

First, according to the uniformity condition, members of a chain must be identical

with respect to their phrase-structural status; that is, a displaced syntactic object must be either minimal or maximal in both the launching and the landing sites (see Chomsky (1995b: 232)). This is not the case under projecting movement, where a displaced syntactic object is maximal before, but not after movement. In result, projecting movement is possible only if the uniformity condition is not part of the grammar.

Second, projecting movement was sometimes claimed to violate Greed incorporated in the definition of Attract in (Chomsky 1995b). This condition prevents syntactic objects from participating in operations unless an operation satisfies a need of this syntactic object. Under the current implementation of projecting movement, a projecting object gets to check its feature upon the movement, so Greed is satisfied.

Third, projecting movement violates the Projection principle proposed by Chomsky (1981, 1986: 84). This principle requires for all selection requirements of syntactic objects to be satisfied throughout the derivation. It is violated by the projecting movement, because a syntactic object that projects after movement must be selected with an unchecked merge feature earlier in the derivation. There are however two further amendments: First, it seems that the Projection principle was initially intended to regulate selection of arguments, but relative clauses are non-obligatory modifiers of noun phrases and may be therefore outside of this principle's scope even though their Merge is also driven by features under the current approach (cf. the discussion in chapter 5). Second, there are further reasons to doubt the Projection Principle. One clear case where it is not respected is late merge (see Lebeaux (1988, 1990) and Takahashi & Hulsey (2009)). Syntactic object that is targeted by late merge must be a part of a derivation before one of its merge features can be satisfied by a late-merged object. To incorporate late merge, Takahashi & Hulsey (2009) (see also Fox (2002), Bhatt & Pancheva (2004)) reject the Projection principle and claim that what can be merged later is regulated by interpretability at LF; that is, a delayed saturation of selection is possible as long as the derivation remains interpretable. This is the case under the late merge of adjuncts, because they are attached by Predicate Modification, and for restrictors of moved operators/determiners, because following the Trace Conversion (Fox 1999), they are supplied to lower copies of the operator by the Variable Insertion operation in any case. Late merge is however not the only violation of the Projection Principle in Minimalism. As noted by Müller (2022), the Projection Principle is regularly violated at intermediate stages of the structure building, when a head has entered the derivation and merged with its complement but not with the specifier, so that its second selectional feature is not yet satisfied.

Locality

Before proceeding with the analysis of relatives with ICA in Moksha, I would like to briefly address yet another common criticism of the raising derivation. It deals with movement of relative clause's head that seems to violate locality restrictions

otherwise imposed on movement in a language. Some of the examples illustrating this are given in (33) and (34). Examples in (33) come from German and show that the head of the relative clause can correspond to a position inside a PP. It thus must move out of the PP under the raising analysis, even though PPs in German are usually opaque for movement of full lexical noun.

(33) a. die Geschichte, [[mit der __] alles angefangen hat]
ART history with ART everything started has
'the story with which everything started'

b. *Welche Geschichte hat alles [mit __] angefangen?
which story has everything with started
'With which story did everything start?' (Heck 2005)

Similarly, the English example in (34) shows that the head of the relative clause can be embedded in the possessor. Movement out of possessors is claimed to be otherwise ungrammatical in English.

(34) the student [[whose __ brother's band] Jonah likes] (Bhatt 2002: 81)

One simple response to this problem is that relative clauses presented above are not derived by raising, but instantiate a different derivation (see Bhatt (2002)). In chapter 3, I have indeed argued for the co-existence of the raising and the head-external analyses, so that these relatives might be derived by head-external structure and thereby do not require an illegitimate movement of the head.

Bhatt (2002) provides further data in support of the hypothesis that heads of relative clauses as in (34) do not move out of the relative CP. The data are given in (35). They show that the low reading of the superlative expected under raising derivation are absent for such relatives.

(35) the **first** movie [whose __ score John said that Shostakovich composed]

a. High reading (available): the first movie whose score John ever said that Shostakovich composed

b. Low reading (unavailable): *the first movie whose score John said that Shostakovich ever composed (Bhatt 2002: 82)

However, the empirical picture turns out to be more controversial: Sportiche (2017) claims that relative clauses with extraction out of the possessor are derived by raising. His argument is based on the so-called Heim's ambiguity (Heim 1979) shown in (36). Harris (2008) argues that the two readings correspond to two different derivations: Reading A is enabled by matching, because it allows for situation variables in the external and in the internal head to be valued differently. Reading B arises under raising, because there is just one instance of the head and its situation variable is bound within the embedded clause.

(36) John guessed the price [that Mary guessed]

a. Reading A: John and Mary's guesses are independent; John and Mary need not have guessed anything about the other, but they must at least have guessed the identity of the same price (or price-product pair).

b. Reading B: John's guess is about Mary's guess, though he need not have guessed anything more about prices himself. (Harris 2008)

Sportiche (2017) applies this diagnostic to relative clauses with extraction from a possessor and claims that the second reading that is derived by raising is grammatical at least for some speakers.

(37) John guessed the integer whose prime factors' exponents Mary guessed

a. Reading A: John and Mary happened to guess related numbers (John an integer, Mary the exponents of the prime factors of this integer) but not necessarily anything about one another. John and Mary need not even know of the other's existence.

b. Reading B: John guessed something about Mary; that is, John guessed the answer to the question "Mary guessed the exponents of the prime factors of what integer?". (Sportiche 2017)

Curiously, however, the literature seems to lack arguments for raising based on more standard diagnostics. Nevertheless, let's assume that relatives with otherwise illegitimate movement are derived by raising and implementations of raising must be able for account for this. The first step would be then to clearly identify the reasons why the relevant movements are excluded in other constructions and as noted by Sportiche (2017) these reasons are often not completely clear and are subject for an independent debate; see, e.g., Davis (2021) showing that the possessor extraction in English is possible at least in some cases pace earlier claims. Here I will not delve into restrictions on extraction in German or English, but would like to point out that under the proposed implementation of raising, movement of the head of the relative clause differs, for instance, from wh-movement in ways that are relevant for locality: Movement is triggered by a [•CP_{rel}•] feature that probes upwards. First, since the feature triggering movement is on NP, there is a clear indication that this NP undergoes movement and thus needs to move to the phase edge and avoid phasal spell-out. Second, since search applies upwards and targets the relative CP, it is expected to have interveners different from those for the downward search for a noun phrase. In particular, other noun phrases are not supposed to act as interveners for this movement.

4.3 Left periphery restriction

4.3.1 Analysis

In this section I will return to relatives with ICA in Moksha and present the analysis of the left periphery restriction. Recall from section 2.3.2 that relatives with ICA cannot follow the main clause material, but must appear on the left periphery:

(38) GEN ← DAT
*Min' jorda-s'k **[škaf-t'i** [kona-n'd'i
we[NOM] throw.away-PST.3.O.1PL.S closet-DEF.SG.DAT which-DAT
mon put-in'ə fətəgrafijə-t'n'ə-n']].
I[NOM] put-PST.3.O.1SG.S photo-DEF.PL-GEN
'We threw away the closet in which I put the photos.'

(39) GEN ← DAT
[Škaf-t'i [kona-n'd'i mon put-in'ə
closet-DEF.SG.DAT which-DAT I[NOM] put-PST.3.O.1SG.S
fətəgrafijə-t'n'ə-n']] min' jorda-s'k.
photo-DEF.PL-GEN we[NOM] throw.away-PST.3.O.1PL.S
'We threw away the closet in which I put the photos.'

I have also argued that the position on the left is a derived one: Relatives with ICA are first merged in the regular nominal position in the main clause, but are then obligatorily displaced to the left as shown in (40).

(40) Relative clauses with ICA

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

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

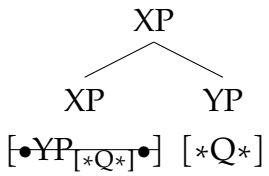
Relative with ICA thus present a pattern that I will call a forced ex-situ effect (also known as local instability; see Ott (2012, 2015)). It is schematically shown in (41). Here, two syntactic objects, XP and YP, form a constituent at an intermediate stage of the derivation, but the constituent must be destroyed before the derivation terminates.

(41) a. Intermediate: [XP YP] – OK
b. Final: YP [XP _] – OK
c. Final: [XP YP] – *

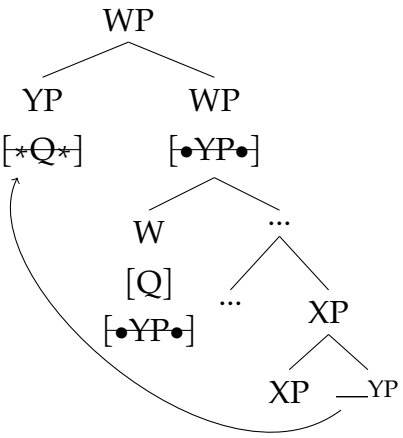
I suggest that the forced ex-situ effect is derived by the second order selection features under the projection by selection algorithm. Consider the sample derivation below. In (42), XP selects for YP with an active feature. Suppose next that this active feature unambiguously indicates that the syntactic object that has it will move out. This is the case if the active feature is a merge feature like the one on the head of the

relative clause, but also if this is an agree feature for a dependency that regularly leads to movement in a given language. One such agree feature is, for instance, the [∗Q∗] on a wh-word in a language where wh-words are moved to left.[25] In that case, if a syntactic object XP selects for YP with the unchecked [∗Q∗], it is then derived that constituent [XP YP] will not persist till the end of the derivation, because YP will be attracted by a higher W head.

(42) Intermediate



(43) Final



This applies to the forced ex-situ effect in Moksha relative clauses as follows. Relative clauses with ICA are peculiar in that the head moves to a case position in the main clause after it has already been assigned case in the relative clause. Movement of a case marked noun to yet another case position seems to be rare cross-linguistically[26] and I would like to suggest that this restriction arises, because verbal heads in fact select for nouns with an unchecked case feature; see (44). The requirement is loosened in Moksha as well as with in other languages with ICA, so that the nature of the unchecked agreement feature is underspecified as in (45). This allows the head of the relative clause that already has case from inside the relative CP to move to another case position, but in that case the DP must have a further unchecked probe. The nature of this probe is not restricted: It can be, for instance, a topic, a focus, or a Q feature, but all of these features ultimately result in the movement of the DP (including the relative clause) to the left.

[25] I assume that if movement of the wh-words is generally present in a language, but applies optionally as in Moksha, then wh-phrases that move to the left have the [∗Q∗] probe, while those that stay in situ do not.

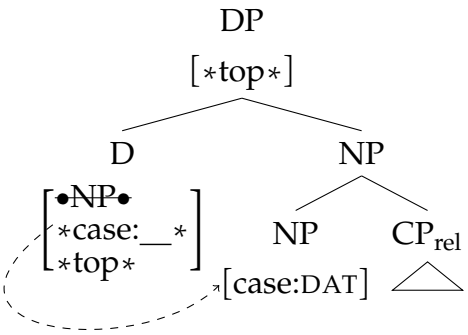
[26] One clear case of movement from one case position to another is hyper-raising, but known examples from languages with case marking show that hyper-raised nouns bear case assigned after movement, in the main clause (see Fong (2019) and Zyman (2022)) and thus pattern with the raising derivation without ICA. Following the analysis in section 4.2.3, this case does not involve movement of the case marked noun to another case position, but a delayed valuation of case, which is possible, because the case probe is ordered after the feature checked upon movement.

(44) No ICA: V [•D$_{[*case*]}$•]

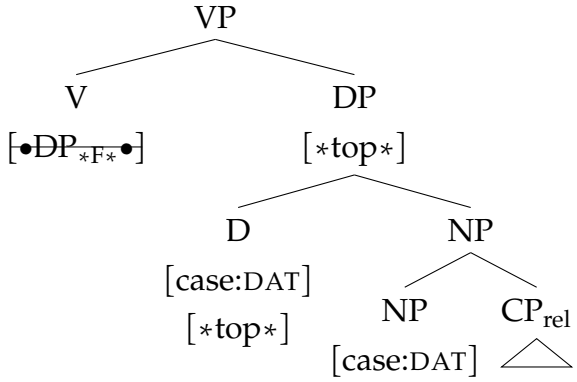
(45) With ICA: V [•D$_{[*F*]}$•]

Let's now consider how this derives the left-peripheral position of relatives with ICA. The relevant part of the derivation starts with the step in (46), where the head with the valued case feature is moved out of the relative CP and the case of the external D head is already valued by the internal case. In the next step given in (47), the DP that includes the relative clause is selected by the head of the main clause. It is V in this derivation. The V head has selection feature [•D$_{[*F*]}$•] and the DP can satisfy it only if it has an active agreement feature. This active agreement feature is usually the unvalued case probe, but this is not possible in relatives with ICA as the head has already received the case inside the relative clause. The DP must therefore have yet another active probe to satisfy the selection requirement. In this derivation, I assume that this is [*top*].

(46) External D

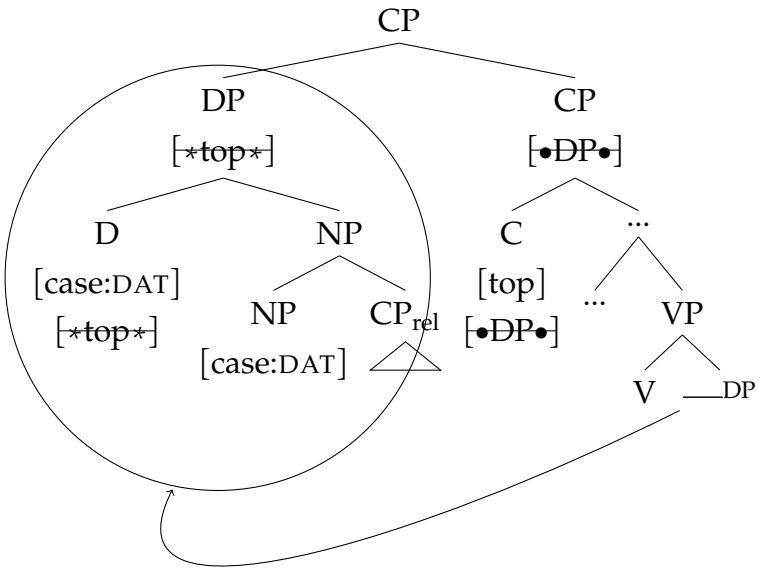


(47) Selection in the main clause



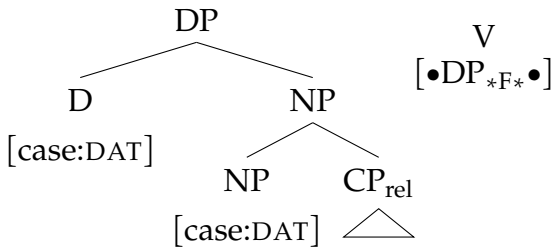
Due to its active topic probe, the DP agrees with the C head and is then attracted to its specifier (see (48)). This inevitably leads to ex-situ position of the DP and thus derives the effect.

(48) Movement to the left



Notably, if a DP that contains the relative clause with ICA does not have an active probe, it cannot be selected by a head in the main clause and the derivation crashes; see (49).[27] This excludes the in-situ position of relatives with ICA.

(49) *Relatives with ICA: No additional probe



Before the analysis is complete, two adjustments are required. First, if the presence of any active probe is sufficient to satisfy the selection requirement of a head that selects the DP, one might wonder why a feature that corresponds to some local clause-internal displacement cannot play a role of the active probe on the DP. I assume that A-movements such as passivization or subject movement to Spec,TP are

[27] In chapter 2, I have also shown that DP that contains a relative clause with ICA can be coordinated to a noun phrase that has a regular case. This provides one of the arguments for the base generation in a regular argument position and subsequent displacement to the left. Coordination, however, also raises further questions for the proposed analysis of obligatory displacement to the left, because main clause projections select for a coordinated constituent then. The problem is not specific for the current case, but inherent to coordination: There are several processes (see, e.g., identical inflection on coordinated predicates) that require external projections to interact with each conjunct individually. Independently of a formal implementation, I assume that for a coordinated constituent to fulfill the selection requirement of a higher head, this requirements must be satisfied by each of the conjuncts (see Huddleston & Pullum (2002: 1323), Patejuk & Przepiórkowski (2022)).

cross-linguistically related to case that is already valued on relatives with ICA. There does not seem to be any other meaningful feature that could be present on a DP and be checked upon such movements. I further suggest that the same holds for local clause-internal scrambling that must be possible in Moksha as the language has a rather free word order (see section 1.2.1). Unlike movements to the left periphery such as wh-movement or topicalization that require an active feature on the displaced noun phrase, clause internal scrambling is driven by optional EPP features (or [•DP•] in the current notation) on clausal heads, but does not require active features on DPs themselves (cf. Miyagawa (2001), Bailyn (2004)). In result, even if a DP that contains a relative clause with ICA is to undergo such a movement, it will still lack a further unchecked feature necessary to fulfill selection requirement and be merged with the main clause material.

Second, if the presence of an active feature that leads to the movement to the left edge is sufficient to satisfy selection requirement, it is expected that further syntactic objects may move to the left across an already displaced relative clause, so that the latter is not the leftmost syntactic object in a clause after all. In section 2.3.2, I have reported that relatives can follows adjuncts (see (50)), but the position after arguments is grammatical only for some of the speakers (see (51)).

(50) NOM ← GEN
Sa-j kizə-t' [**s'ora-n'ɛ-t'** [kona-n'
come-PTCP.ACT summer-DEF.SG.GEN boy-DIM-DEF.SG.GEN which-GEN
Kat'ɛ tona-ft-əz'ə luv-əmə]] škola-v
Katja[NOM] learn-CAUS-PST.3SG.O.3SG.S read-INF school-LAT
mol'-i.
go-NPST.3[SG]
'Next year the boy whom Katja teaches to read will go to school.'

(51) GEN ← DAT
?Kat'ɛ [**škaf-t'i** [kona-n'd'i mon put-in'ə
Katja[NOM] closet-DEF.SG.DAT which-DAT I[NOM] put-PST.3.O.1SG.S
fətəgrafijə-t'n'ə-n']] jorda-z'ə.
photo-DEF.PL-GEN throw.away-PST.3SG.O.3SG.S
'Katja threw away the closet in which I put the photos.'

I assume that adjuncts can be base generated on the left periphery and therefore freely precede relatives with ICA. Arguments, on the other hand, must move to the left across a displaced relative clause. This is impossible for some speakers due to defective intervention: DP with the relative clause already moved to Spec,CP intervenes and blocks probing for yet another DP with analogous features (see Fanselow (1996), Ferguson & Groat (1994), Starke (2001), Rizzi (2004), Haegeman (2012)). This presupposes that all Ā-related features targeted by movement to Spec,CP form a natural class. A further support for this assumption in Moksha comes from extraction out of the relative CP that shows a very similar restriction on movement

across the relative pronoun (see the data in section 2.3.4 and the analysis in section 4.4.2 below).

In result, the position of relatives with ICA in Moksha is determined by the interpretation of selection requirements of main clause heads and the rigid setup of the left periphery. This seems to be a welcome outcome: Reviewing ICA in different languages, Abramovitz (2021) shows that while relatives with ICA are always displaced to the left,[28] the exact position of a relative clause varies in whether it can follow phrases dislocated to the left. This state of affairs is derived by my analysis if second order selection underlying movement to the left is uniform in all languages with ICA, while the properties of the left periphery and the possibility to move across the relative clause vary.

To sum up, I have suggested that the obligatory left-peripheral position of relatives with ICA follows from the requirement for DPs to have an active probe when they enter the derivation. This requirement is formally implemented by means of second order merge features that allow selection to apply not only for a category, but also for further active features of the selected syntactic object. Note that the idea of selection for further unsaturated features is by itself not new. It is used in Categorial Grammar (see Steedman (2014), i.a.), where selection often applies for further unsaturated features. The proposal here is however different in that active features that selection applies for are not automatically checked upon Merge, but remain active on a selected syntactic object. In result, local selection of a syntactic object with some active feature determines how the selected syntactic object will behave later in the derivation and thus whether the created constituent will be destroyed before the derivation terminates.

4.3.2 The alternative

One previous account of forced ex-situ effects was suggested by Ott (2012, 2015) on the basis of the novel labeling algorithm proposed by Chomsky (2013, 2015) and further developed by Epstein, Kitahara, & Seely (2014, 2020), Boškovič (2016), Ginsburg (2016), Rizzi (2016), Hayashi (2020), Moro & Roberts (2020), Nakashima (2020), Blümel (2022), Ke (2022), McInnerney (2022) among others. I will now briefly introduce this labeling algorithm. It is formulated in the system, where Merge is not triggered by features, but applies freely. As a result, labeling is not required for selection in syntax and takes place at the phase level after all Merge operations have already applied. The underlying idea is that labeling applies under minimal search and its outcome depends on the phrase-structural status of merged syntactic objects. Three configurations are distinguished: Merge of a head (i.e., a syntactic terminal)

[28] Abramovitz (2021) argues that relatives with ICA are internally-headed. Relative clauses in West African Gur languages illustrate the same relativization type, but allow the relative clause to stay in-situ. I have argued that relatives with ICA are externally-headed and consequently cannot be of the same type as internally-headed relatives in Gur.

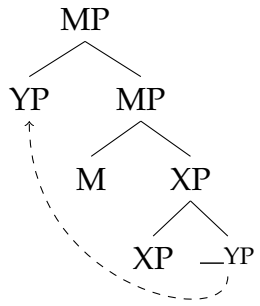
with a phrase, Merge of two phrases, and Merge of two heads. Let's consider these three cases one by one.

First, if a head is merged with a phrase, being an atomic computational item the head determines the label as shown in (52). As pointed out by Rizzi (2016), a significant complication is introduced by head movement, because complex syntactic objects created by head movement seem to count as heads for labeling and the property of being a head must be then essentially encoded as a diacritic.

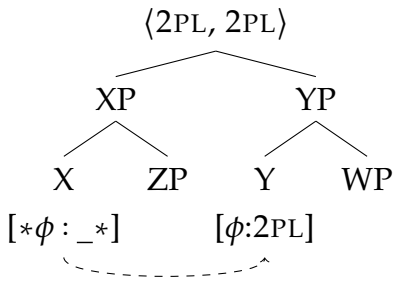
(52) {X, YP}

The second relevant configuration is created by Merge of two phrases. Chomsky (2013) suggests that minimal search finds the two heads of the merged phrases and thus does not give an unambiguous result. There are then two ways to avoid crash and determine a label. First, one of the merged phrases may undergo further movement and thereby, by assumption, turn invisible for the labeling algorithm. The remaining phrase then provides a label; see (53). Second, if heads of the two merged phrases agree in some feature, this feature is then taken as a label for the created constituent; see (54). Note that in the latter case, it is not the category that provides a label, but a feature present on both heads.

(53) {XP, YP}: Movement



(54) {XP, YP}: Agreement



The third configuration relevant for the labeling algorithm is created by the Merge of two heads. Chomsky (2013) considers this configuration on the basis of a category-defining head and a root and suggests that since roots have no category, the category-defining head always labels. Chomsky (2015) further complicates the algorithm by introducing the concept of a weak head that by definition cannot provide a label. Thus, if two heads are merged, one of them must be weak, so that the other one could label. This addition has implications for the first {X,YP} configuration in that a weak head also cannot provide a label being merged with a phrase, but it

can be strengthened by other features and label then.

Building on this labeling algorithm, Ott (2012, 2015) suggests an analysis of forced ex-situ effects. The analysis utilizes the configuration where two phrases are merged, but do not agree in any feature, so that for labeling to be possible one of the phrases must move out. The failure to label thus ensures that a constituent formed at an earlier stage of a derivation must be destroyed before labeling applies at the phase level. Ott (2012, 2015) applies this analysis to derive split topicalization construction in German, to which I will return in the next chapter. Here I will investigate whether this analysis derives obligatory left-dislocation of relatives with ICA in Moksha. For the analysis to apply to the Moksha data, two preconditions must be met. First, DPs containing a relative clause with ICA must merge with another phrase, not with a head. Second, heads of the two merged phrases cannot share features. I will show that both of these requirements are not fulfilled.

Starting with the first one, DPs with relative clauses can be merged in any argument or adjunct positions in the main clause and in some of these positions DPs are standardly assumed to be merged with a head. One such case is for instance the direct object position, where a DP is merged directly with the V head. Nevertheless, direct object relative clauses with ICA must be also moved to the left; see (55).

(55) GEN ← NOM
Uča-**t'n'ə** [kona-t'n'ə aščʲ-t kut-t'
sheep-DEF.PL[NOM] which-PL[NOM] be-PST.3-PL house-DEF.SG.GEN
ingəl-ə] mon' al'n'ɛka-z'ə l'ɛc'-əz'ən'.
before-LOC I.GEN uncle-1SG.POSS.SG[NOM] shoot-PST.3PL.O.3SG.S
'My uncle shot the sheep that are in front of the house.'

Pushing this analysis further, one may explore the notion of weak heads added to the model in Chomsky (2015). In this case, V (or R in Chomsky's notation) must be strengthened by Agree before it can provide a label. Chomsky proposes that the head agrees with the direct object . This agreement is not overtly realized in numerous languages, where it needs to be postulated, but can be overt in Moksha and is also present for RCs with ICA; see (55) again. Hence, there is no problem for labeling and no reason for movement of RCs with ICA to the left edge.

Turning now to the second requirement that the heads of the two merged phrases do not agree, this also does not hold in all configurations where the DP with ICA merges with another phrase. While DPs with ICA do not receive case in the main clause, ϕ-agreement applies to them as to regular arguments; see (56) for the subject agreement and (55) above for the object agreement.

(56) NOM ← DAT
[Pin'ə-t'n'-**n'd'i** [kona-t'n'-n'd'i maks-in'ə jaṛca-ma-t']]
dog-DEF.PL-DAT which-PL-DAT give-PST.3.O.1SG.S eat-NZR-DEF.SG.GEN
aščʲ-t' dvor-sə.
be-NPST.3-PL yard-IN

'The dogs that I gave food are in the yard.'

Overt agreement in ϕ-features shows that there is a head in the main clause that shares features with the DP and thus labeling by shared features is predicted to be possible. For instance, in case of the subject agreement in (56), independently of whether it is the TP or the vP that hosts the subject agreement probe in Moksha, the subject DP with ICA must be then able to stay in the specifier of one of these projections that agrees with it according to Chomsky's labeling algorithm. Testing this prediction is complicated by the fact that subjects are usually in the beginning of the sentence, so that it is not immediately clear whether they move to the Spec,CP as well. The data in (57)-(58) suggest that subjects are also displaced. Example (57) shows that the relative clause is positioned before the TP-level adverb that must precede other TP-internal material under standard assumptions.

(57) NOM ← DAT
[Jalga-z'ə-**n'd'i** [kona-n'd'i mon zvon'-ən']] navernə
friend-1SG.POSS.SG-DAT which-DAT I[NOM] call-PST.1SG probably
sɛv-in'ə kn'iga-t'.
take-PST.3.O.1SG.S book-DEF.SG.GEN
'Probably my friend whom I called takes the book.'

The examples in (58) further include the direct object that is scrambled across the adverb. Sentence (58a) shows that the relative clause with ICA is to the left of both the direct object and the adverb. Sentence (58b) demonstrates that the relative clause cannot follow the adverb as it would be expected if it could remain in Spec,TP or Spec,vP.

(58) a. NOM ← DAT
[Jalga-z'ə-**n'd'i** [kona-n'd'i mon zvon'-ən']]
friend-1SG.POSS.SG-DAT which-DAT I[NOM] call-PST.1SG
kn'iga-t' navernə sɛv-in'ə.
book-DEF.SG.GEN probably take-PST.3.O.1SG.S
'Probably my friend whom I called takes the book.'

b. NOM ← DAT
*Kn'iga-t' navernə [jalga-**z'ə-n'd'i** [kona-n'd'i
book-DEF.SG.GEN probably friend-1SG.POSS.SG-DAT which-DAT
mon zvon'-ən']] sɛv-in'ə.
I[NOM] call-PST.1SG take-PST.3.O.1SG.S
'Probably my friend whom I called takes the book.'

To sum up, I have considered the alternative analysis of forced ex-situ effects that is based on Chomsky's labeling algorithm. According to this analysis, some formed constituents are unlabelable unless one of the merged syntactic objects moves out. I have shown that this analysis does not account for the forced ex-situ effects in Moksha, because a constituent that a DP with ICA forms with the main clause material can often be labeled without movement. In result, the analysis does not

extend to the Moksha data even though they clearly show the same pattern as the core data the analysis was developed for. I suggest that this undermines the approach in general, thereby also taking some empirical foundation from this approach to labeling. In chapter 5, I will show that the analysis relying on projection by selection algorithm proposed here can account for the data that motivated this alternative as well as for further similar patterns in other languages.

4.4 Further properties

In this section I will go through remaining properties of relative clauses with ICA and show how they are accounted under the proposed analysis of relative clause structures. I will start with coordination and extraposition in section 4.4.1, then turn to movement out of the relative clause in 4.4.2. In section 4.4.3, I will talk about the appositive interpretation and speculate how it can be reconciled with the raising structure. Finally, I will present an analysis of case mismatches in section 4.4.4.

4.4.1 Extraposition and coordination

In section 2.3.3, I have demonstrated how standard constituency diagnostics such as coordination and extraposition apply to relative clauses with ICA. The data have shown that coordination of two relative CPs under one head with internal case is possible; see (59).

(59) NOM ← GEN
Jalga-t' [**kona-n'** vɛt'-in'ə kud-u] i
friend-DEF.SG.GEN which-GEN bring-PST.3.O.1SG.S house-LAT and
[**kona-n'** and-in'ə l'ɛm-də] kurək n'i tu-j.
which-GEN 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.'

The coordination is expected if the head with an internal case is outside of the relative CP as I have proposed above. A complication however comes from the raising analysis: It implies that the head undergoes across the board (ATB) movement out of the coordinated CPs. I assume an asymmetric approach to ATB-movement, under which extraction takes place only from one conjunct and is accompanied by movement of an operator (a relative pronoun, in this case) in the other conjunct (see Munn (1993), Franks (1995)). The structure of coordinated relative clauses with ICA is then summarized in (60).

(60) Coordination of relatives with ICA
[NP [[$_{CP}$ rel.pron ... __] and [$_{CP}$ rel.pron ... __]]]

In (59), the same case is assigned to the relativized constituent in both conjuncts. Examples in (61a-b) show different cases assigned to the relativized position. These examples show that the head can be marked for case from either of the two conjuncts. This suggests that movement can proceed from the first as well as from the second conjunct.

(61) a. NOM ← GEN
Jalga-t' [**kona-n'** vɛt'-in'ə kud-u] i
friend-DEF.SG.GEN which-GEN bring-PST.3.O.1SG.S house-LAT and
[**kona-n'd'i** n'ɛft'-in'ə od škaf-t'] kurə
which-DAT show-PST.3.O.1SG.S new cupboard-DEF.SG.GEN soon
n'i tu-j.
already go-NPST.3[SG]
'The friend who I brought home and whom I showed the new cupboard is going to leave soon.'

b. NOM ← DAT
Jalga-t'i [**kona-n'** vɛt'-in'ə kud-u] i
friend-DEF.SG.DAT which-GEN bring-PST.3.O.1SG.S house-LAT and
[**kona-n'd'i** n'ɛft'-in'ə od škaf-t'] kurək
which-DAT show-PST.3.O.1SG.S new cupboard-DEF.SG.GEN soon
n'i tu-j.
already go-NPST.3[SG]
'The friend who I brought home and whom I showed the new cupboard is going to leave soon.'

These data seem to violate the parallelism condition imposed on ATB-movement. There are though at least three understandings of this condition. Under the first and the most general one, it requires that there are movement dependencies targeting the base position of the ATB-moved constituent in both conjuncts, which is indeed the case in Moksha examples. Under the second interpretation, it is required that the syntactic position of the extracted syntactic object is identical in both conjuncts. This condition is not met in (62), where the gap is in the direct object position in the first relative CP and in the indirect object position in the second one. There are however attested cases in other languages, where ATB-movement is grammatical despite differences in syntactic positions of moved constituent (cf. the discussion by Hartmann, Konietzko, & Salzmann (2016)). Under the final interpretation of the parallelism condition, it is the morphological case marking on the ATB-moved constituent that must realize the case assigned to the corresponding position in both conjuncts (see Borsley (1983), Franks (1993), Hein & Murphy (2020)). This condition is violated in the examples above, where genitive is assigned in the first conjunct, dative in the second one, and the ATB-moved head realizes only one of these cases. ATB-movement of the head of the relative clause however differs from other instances of ATB-movement in that movement proceeds to the case position, and consequently for regular externally-headed relative clauses the head always shows a case different from the one assigned in the relative clause. Despite the fact the head preserves the

case assigned in the relative clause under ICA, I suggest that the parallelism in case is not present for relative clauses in general and also does not apply here. It remains for further research to show how this can be implemented and reconciled with existing approaches to the parallelism condition.

I will now turn to extraposition. The data in (62) repeated from chapter 2 show that extraposition of the relative CP is ungrammatical if the head is marked for the internal case.

(62) a. NOM ← DAT
***S't'ər'-n'ɛ-t'i** tu-s' kaftə n'ed'ɛl'a-t [**kona-n'd'i**
girl-DEF.SG.DAT go-PST.3[SG] two week-PL which-DAT
maks-in'ə kel'gəma kn'iga-z'ə-n'].
give-PST.3.O.1SG.S favorite book-1SG.POSS.SG-GEN
'The girl left for two weeks, whom I gave my favorite book.'

b. NOM ← DAT
S't'ər'-n'ɛ-t'i [**kona-n'd'i** maks-in'ə kel'gəma
girl-DEF.SG.DAT which-DAT give-PST.3.O.1SG.S favorite
kn'iga-z'ə-n'] tu-s' kaftə n'ed'ɛl'a-t.
book-1SG.POSS.SG-GEN go-PST.3[SG] two week-PL
'The girl whom I gave my favorite book left for two weeks.'

Abramovitz (2021) takes analogous data in Koryak as an indication that relative clauses with ICA are internally-headed. In section 2.3.3, I have however claimed that the ban on extrapostion is typical for raising relative clauses and is therefore expected for relatives with ICA. The account of the incompatibility of extraposition with the raising derivation is based on the analysis of extraposition by Fox & Nissenbaum (1999). According to this approach, extraposition of adjuncts is derived by silent movement of the host with subsequent late-adjunction in the dislocated position. For relative clauses, the derivation is schematized in (63).

(63) a. Movement of the head NP
$[_{MC}$ [... DP ...] DP]

b. Late adjunction of the relative CP and realization of the lower copy
$[_{MC}$ [... DP ...] [~~DP~~ $[_{CP}$ rel.pron ...]]]

Hulsey & Sauerland (2006) (see also Takahashi & Hulsey (2009)) use this analysis to derive the ban on extraposition in raising relative clauses. Since under the raising derivation, the head of the relative clause moves out of the relative CP, it inevitably merges with this CP before it can be merged with any main clause material. Consequently, the head cannot undergo movement in the main clause before the relative CPs late-adjoins to it as required by the approach to extraposition sketched above. Hulsey & Sauerland (2006) also position the head of the relative clause inside the relative CP, in its highest specifier, but such position of the head has no impact on extraposition: Having a final landing site outside of the relative CP, the head that

originates in the relative CP still cannot be merged with the main clause first and thus extraposition is still excluded.

Recall that relatives with external case allow for extraposition in Moksha (see (64)). As argued in chapter 3, these relatives instantiate the head-external structure and thus nothing prevents the late merge of the relative CP to the displaced head as shown in (63).

(64) **S't'ər'-n'ɛ-s'** tu-s' kaftə n'ed'ɛl'a-t [**kona-n'd'i**
girl-DEF.SG[NOM] go-PST.3[SG] two week-PL which-DAT
maks-in'ə kel'gəma kn'iga-z'ə-n'].
give-PST.3.O.1SG.S favorite book-1SG.POSS.SG-GEN
'The girl left for two weeks, whom I gave my favorite book.'

4.4.2 Extraction out of the relative clause

In section 2.3.4, I have shown that relatives with internal case allow extraction out of the relative CP (see (65)), but this is ungrammatical for relatives with external case (see (66)).

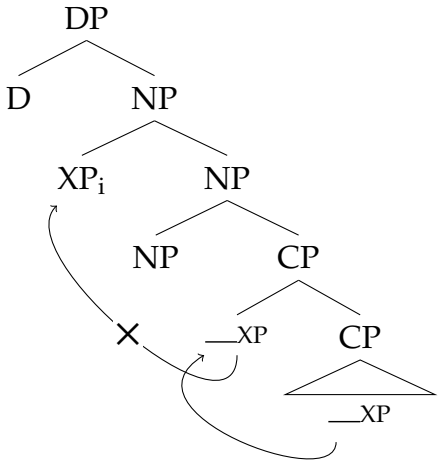
(65) NOM ← DAT
Bibl'iat'eka-stə [**jalga-z'ə-n'd'i** [kona-n'd'i mon
library-EL friend-1SG.POSS.SG-DAT which-DAT I[NOM]
sɛv-in'ə kn'iga-t' __]] kelk-si
take-PST.3.O.1SG.S book-DEF.SG.GEN love-NPST.3SG.O.3SG.S
luv-əm-s.
read-INF-ILL
'My friend for whom I took the book from the library loves to read.'

(66) *Bibl'iat'eka-stə [**jalga-z'ə** [kona-n'd'i mon
library-EL friend-1SG.POSS.SG[NOM] which-DAT I[NOM]
sɛv-in'ə kn'iga-t' __]] kelk-si
take-PST.3.O.1SG.S book-DEF.SG.GEN love-NPST.3SG.O.3SG.S
luv-əm-s.
read-INF-ILL
'My friend for whom I took the book from the library loves to read.'

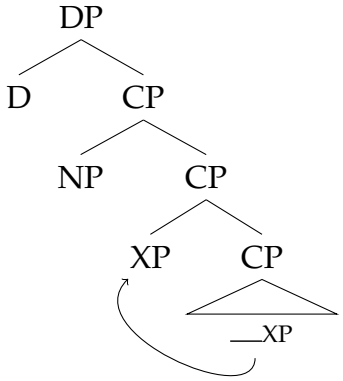
Extraction out of the relative clause is surprising given that relative clauses are one of the textbook examples of island structures (see Ross (1967)). Nevertheless, there are numerous examples in the literature showing that extraction out of a relative clause is possible under certain conditions; see Erteschik-Shir (1973), McCawley (1981), Engdahl (1997), Cinque (2010), Kush et al. (2013), Sichel (2018), Vincent (2021). Most recently, investigating extraction out of relative clauses in Hebrew, Sichel (2018) suggested that extraction is enabled by the raising derivation. She claims that extraction out of the relative CP is ungrammatical under the non-raising structure shown in (67), because the NP (not the DP) and the CP are phases and the extracted syntactic object has to pass through both their specifiers, which is however prohibited

by antilocality, that is, movement from Spec,CP to Spec,DP is ruled out as too local. She further assumes that the head of the relative clause is in Spec,CP under the raising derivation (see (68)), so that the extracted syntactic object is accessible for further movement in Spec,CP and there is no need for the illegitimate short movement.

(67) *Extraction



(68) OKExtraction



This analysis relies on the placement of the head in the specifier of the CP and therefore is incompatible with the current implementation of raising. Nevertheless, following the gist of Sichel's analysis, I would like to suggest that extraction out the relative clause in Moksha is related to the raising derivation, to the internal case marking on the head in particular. I assume that CPs as well as DPs (see Svenonius (2004), Matushansky (2004), Bošković (2014)) are phases and are subject to the Phase impenetrability condition (PIC) given in (69).

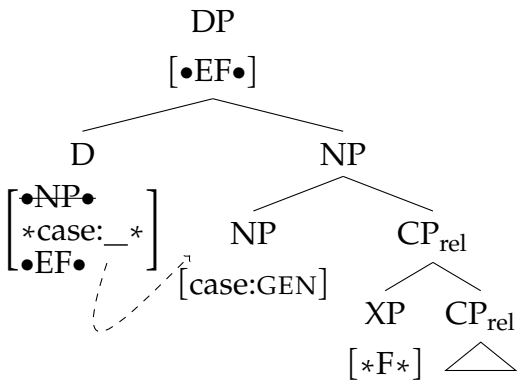
(69) Phase impenetrability condition:
In phase α with head H, the domain of H is not accessible to operations outside α, only H and its edge are accessible to such operations.
(Chomsky 2000: 108)

Under PIC, in order to be extracted out of the phase, a syntactic object must first move to its edge. I assume that this movement is triggered by optional edge features on phase heads (see Chomsky (2008)). Applied to movement out of relative clauses, this means that extracted syntactic objects must move to the CP edge and then to the DP edge. I propose that it is the second step, i.e., movement to the DP edge that is impossible in relatives with an external case. In particular, I would like to suggest that in Moksha edge features that allow syntactic objects to move to the DP edge are ordered after the case probe, so that movement to the DP edge is possible only after the DP gets its case.

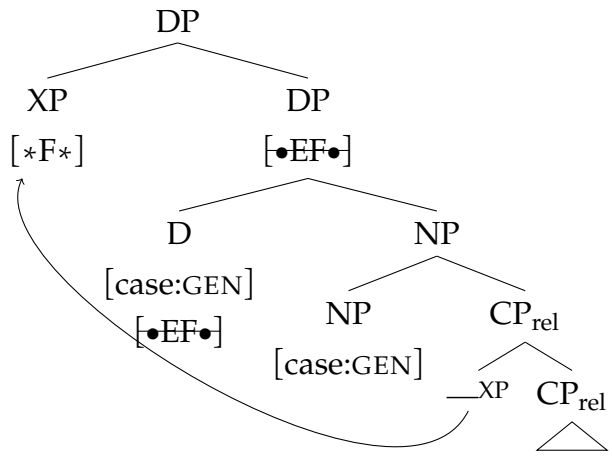
As heads of relative clauses with ICA have case from inside the relative clause, their edge features are readily available when the DP is first built. This allows

syntactic objects to move from the CP edge to the DP edge before material in the complement of the D head is rendered inaccessible. This part of the derivation is illustrated in (70)-(71). In (70), the D head is introduced to the derivation and it receives internal case from the NP. The XP that must be extracted out of the relative clause is in the specifier of the CP at this point. Case assignment makes edge features that are ordered after the case probe accessible, so that the extracted XP can move to Spec,DP as shown in (71).

(70) External D gets case



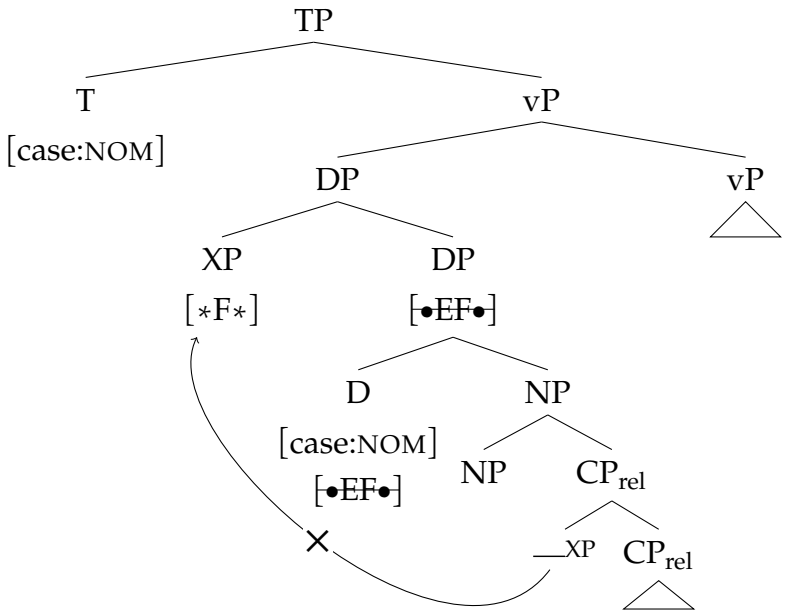
(71) Movement to DP edge



Heads of regular externally-headed relative clauses, on the contrary, receive case from higher projections in the main clause. As a result, when the D head gets case and its edge features become in principle available, the material inside the complement is already rendered inaccessible for movement, so that the extracted syntactic object is trapped in Spec,CP and the derivation cannot succeed; see (72).[29]

[29] Note that for case assignment to the NP, it is required either for Agree in general or at least for upward probing to be exempt from PIC; cf. Bošković (2007a,b) on the difference in locality domains for movement and agreement.

(72) *Extraction



The analysis has far-reaching consequences for Moksha syntax: DPs not modified by a relative clause 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. The analysis thus seems to exclude all extraction out of DPs in Moksha, which is incorrect empirically. One clear case of extraction out of the DP in Moksha that we have already talked about is movement of the head NP. It however differs in that movement is triggered by features of the NP itself, so that PIC as it is stated in (69) is not violated: The domain of the phase head may still be opaque for search from higher projections: Moreover, it is the whole complement of the D head that undergoes movement, so that the material *inside* the complement may still remain opaque for extraction.

Putting this case aside, the data suggest that Moksha also allows for simpler cases of extraction out of the DP such as possessor extraction shown in (73).

(73) [T'ɛ ava-t'] Kol'ɛ kepəd'-əz'ə [__
this woman-DEF.SG.GEN Kolja[NOM] lift-PST.3SG.O.3SG.S
sumka-nc].
bag-3SG.POSS.SG.GEN
'Kolja picked up this woman's bag.'

To account for these data, 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. For instance, for the possessor in example (73), one can assume that it must be moved to Spec,DP for

case assignment.[30] Syntactic objects extracted out of the relative clause are different, because they do not belong to the DP and there can be therefore no independent reasons for them to move to the DP edge.

Proposed analysis accounts for restrictions on extraposition out of RCs with ICA in a following way. Recall that unlike in Hebrew in Moksha the extraction of adjuncts is allowed by all speakers, while judgments vary regarding extraction of arguments. Some native speakers do not allow extraction of arguments out of the relative CP (see (74)) and they also do not allow an extracted constituent to be bound inside the relative CP (see (75)).

(74) NOM ← GEN

%Kat'ɛ [kn'iga-**t'** [kona-n' __ sɛv-əz'ə
Katja book-DEF.SG.GEN which-GEN take-PST.3SG.O.3SG.S
bibl'iat'eka-stə]] ašč-i stol-sə.
library-EL be-NPST.3[SG] table-IN
'The book that Katja took from the library is on the table.'

(75) NOM ← DAT

*Es'$_i$ bibl'iat'eka-stə [**jalga-z'ə-n'd'i** [kona-n'd'i Kat'ɛ$_i$
self library-EL friend-1SG.POSS.SG-DAT which-DAT Katja[NOM]
sɛv-əz'ə kn'iga-t' __]] kelk-si
take-PST.3SG.O.3SG.S book-DEF.SG.GEN love-NPST.3SG.O.3SG.S
luv-əm-s.
read-INF-ILL
'My friend for whom Katja took the book from her library loves to read.'

I suggest that these data converge with the data presented in section 2.3.2 and analyzed in 4.3 above. They show that adjuncts from the main clause can precede relative clauses with ICA, while for arguments such a position is grammatical only for some speakers. I have suggested that the pattern arises, because adjuncts can be base generated on the left, while arguments have to move there. This movement is illegitimate for some speakers due to defective intervention: The relative clause displaced to the left earlier blocks further probing for other syntactic objects bearing Ā-related features. This also accounts for the observed restrictions on extraction out of the relative clause: Adjuncts can be base generated in Spec,CP, so that their further extraction is always grammatical. Arguments must move to this position, which turns out to be impossible for speakers sensitive to defective intervention. In this case, the relative pronoun moved to the Spec,CP earlier acts as an intervener.[31] This also derives the binding data: Speakers sensitive to intervention do not allow for

[30] Recall that heads raised out of the relative clause can contain a possessor. I suggest that it does not raise to the specifier of the D_{rel} head, because the latter does not assign the genitive case. The possessor moves to the specifier of the external D head after the head NP has moved to the main clause.

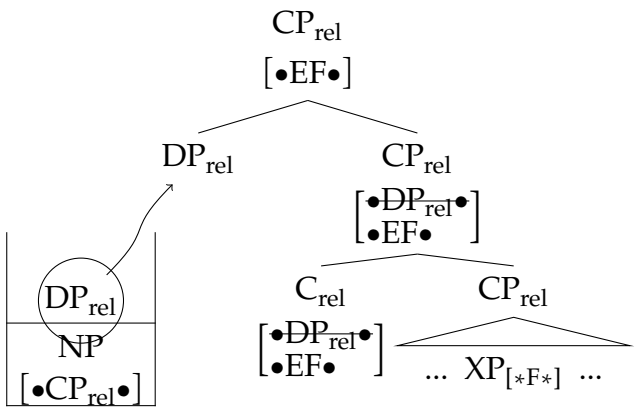
[31] Since the movement of the extracted XP is triggered by the edge features on the C head, for defective intervention to apply these features must belong to the same class with other Ā-related features.

extracted adjuncts to be bound in the relative CP, because to be extracted they must be first merged on the left edge and are therefore not c-commanded by any material in the relative CP.

To sum up, I have suggested that the difference between relatives with internal and external case with respect to extraction follows from the different timing of case assignment combined with the ordering of the edge feature after the case probe. Note that this account cannot be extended to extraction out of the raising relative clauses without ICA in other langauges. I suggest that this is again a welcome result, because restrictions on extracted syntactic objects are not identical cross-linguistically. For instance, Sichel (2018) claims that in Hebrew arguments but not adjuncts can be extracted and extraction is restricted to indefinite heads and existential main clauses (see also Vincent (2021) on restrictions in English). These requirements do not hold in Moksha, so I suggest that distinct mechanisms are responsible for the obviation of relative clause islands in different languages.

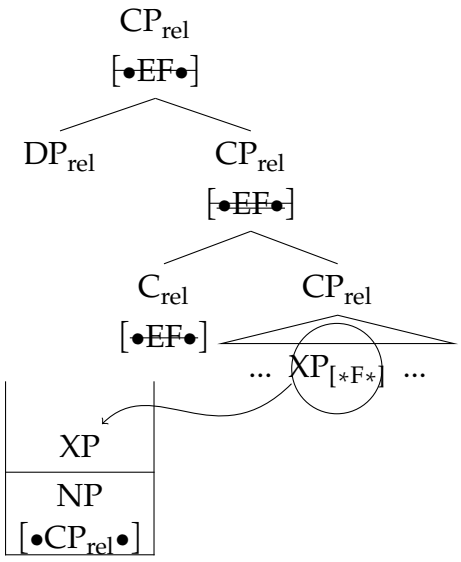
Before finishing the section, one further clarification in required: It remains to be shown how the movement of an extracted syntactic object to the CP edge is derived given the current implementation of raising. Recall that at the point when the C head is merged both the head NP probing upwards and the [•DP_{rel}•] feature on the C head find their goals and both are copied to the ordered feature stack, so that the relative DP is at the top and it merges back to the derivation first as shown in (76).

(76) Merge of DP_{rel}

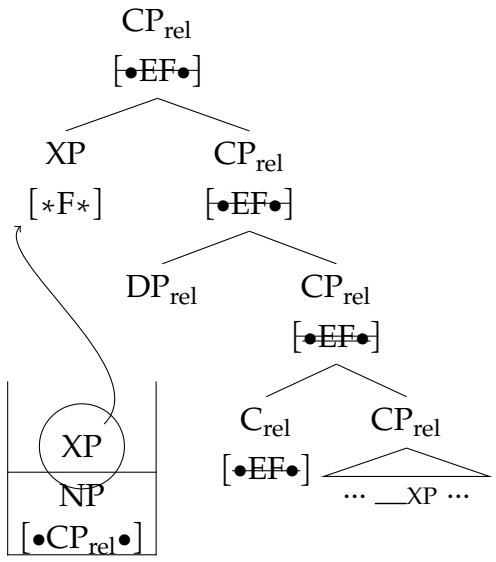


If the CP has an active edge feature, then after Merge of the relative DP, there is a new selection feature on the top of the stack, so that the derivation once again reaches the state where there are two active merge features. I suggest that the XP targeted by the edge feature on C is copied and placed in the stack where NP is already located; see (77). In result, XP must merge in the derivation before the NP does; see (78). This allows syntactic objects to undergo intermediate movement to Spec,CP before the NP merges and projects blocking further movement to Spec,CP.

(77) XP is copied



(78) Merge of XP



4.4.3 Appositive interpretation

As shown in section 2.3.1, relative clauses with ICA can have a restrictive as well as an appositive interpretation. Under the appositive interpretation, the relative clause is not interpreted in the scope of the external determiner and does not restrict the reference of the head, but provides an additional background information about it. The appositive reading of relatives with ICA is illustrated by examples (79) and (80).

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

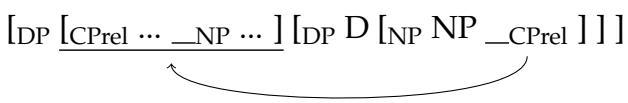
(80) NOM ← GEN
Rovnaj kaftə pr'istupn'ik-n'ə-**n'** [kona-t'n'ə-n' meždu pročim
straight two criminal-DEF.PL-GEN which-DEF.PL-GEN between others
kunda-z'ən' Pet'ɛ] vor'gəd'-kšn'ə-s'-t'.
catch-PST.3PL.O.3SG.S Petja[NOM] run.away-AVR-PST.3-PL
'Exactly two criminals, who Petja, by the way, caught, were running away.'

Due to differences in scope of the external determiner and interpretation, appositive relative clauses are commonly assumed to instantiate a derivation distinct from the one assigned to the restrictive relative clauses and be incompatible with the raising of the head out of the relative clause (see Emonds (1979), Jackendoff (1977), and Citko (2008a), i.a.). A further property often used as an argument against raising in appositive relative clauses is the absence of connectivity effects. In fact,

however, the data available in the literature are contradictory: For instance, Kayne (1994: 112-113) and Heck (2005) report that heads of appositive relatives can participate in processes inside the relative clause, while Bianchi (1999) and De Vries (2006) claim that (with some minor exceptions) connectivity is not attested. While I have no data on interpretational connectivity effects such as binding or idioms in Moksha appositive relatives, the examples in (79)-(80) as well as the data in section 2.3.1 show that heads of appositive relatives can be marked by the internal case. Combined with the conclusion in chapter 3 that internal case corresponds to the raising derivation, this indicates that appositive relative clauses must be derived by raising as well. The goal of this section is to explore how appositive interpretation of relatives with ICA can be reconciled with their raising syntax. I will present three ways to do so.

The first option was suggested by Kayne (1994) and developed by Bianchi (1999). They suggest that appositive relative clauses are derived by raising followed by a movement of the relative clause at LF to the external specifier of the D head. In the original proposal, the constituent that undergoes movement is IP, but under the current implementation where the DP moves out of the relative CP, it can be also the relative CP that is moved; see (81).

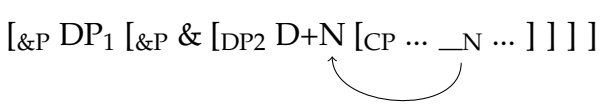
(81) Appositive relatives clauses derived by raising plus CP movement:



Movement derives the fact that relative clauses are not in the scope of the external determiner. Bianchi (1999) further suggests that movement of the CP forces interpretation of a higher copy: If the head were to be interpreted in its base position, then there will be no material in the scope of the external head. Bianchi claims that this instantiates a vacuous quantification and is therefore excluded.

The second option is suggested by De Vries (2002, 2006) (see also Sportiche (2017)). According to this approach, appositive relative clauses have the structure illustrated in (82):

(82) Specifying coordination for appositive relatives clauses:



Under this approach, appositive relative clauses involve a specifying coordination. The first conjunct is the overt DP that is realized before the relative CP, but was never part of the relative CP. The second conjunct is the raising relative clause with the null head. The structure clearly derives that the relative clause is not in the scope of the external determiner as well as that the relative CP provides only additional background information about the referent. However, under this analysis the head that has raised out of the relative clause is not the noun phrase that precedes the

relative CP on the surface. This analysis, thus, does not predict internal case marking as attested in Moksha relative clauses. To account to the internal case, it is necessary to assume that the DP_1 in the first conjunct agrees in case with the null head that moves out of the relative CP; see (83).

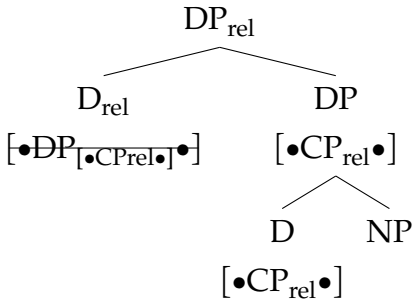
(83) ICA by specifying coordination:

$[_{\&P}\ DP_1\ [_{\&P}\ \&\ [_{DP2}\ D{+}N\ [_{CP}\ \dots\ \_N\ \dots\ ]\ ]\ ]\ ]$

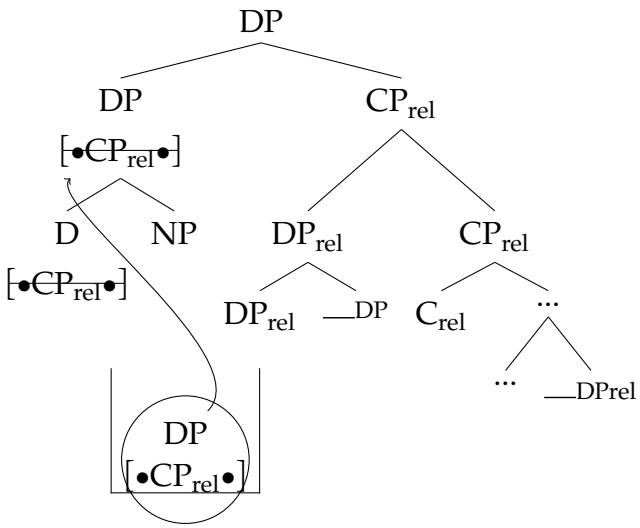
case

There is also a third way to reconcile appositive relative clauses with the raising derivation. I would like to suggest that the correct structure for appositive relative clauses is derived if it is the DP rather than the NP that moves out of the relative clause. The relative pronoun (the D_{rel}) selects for a DP as shown in (84). This DP moves out of the relative clause and and projects in its final landing site yielding the structure in (85). In this final structure, the CP is not in the scope of the determiner.

(84) Relative DP



(85) Merge of the head DP



This approach seems to be promising, but to be complete it must be ensured that the DP is interpreted only in the landing position, but not inside the relative clause. While there are known cases where a moved syntactic object must be interpreted exclusively in its landing site (cf. Fox (1995, 1999) on antecedent contained deletion), at this point it is unclear to me how this can be enforced for relative clauses here.

To sum up, I have sketched three ways to derive the appositive interpretation of relative clauses with ICA. Each of them can in principle account for the data, but they all raise further questions. Movement of the relative CP (or IP) out of the scope of the external determiner introduces an otherwise unattested movement.[32] Specifying

[32] Depending on the nature of the CP movement, the analysis might be at variance with the account of the ban on extraposition suggested in section 4.4.1, because it requires all cases of extraposition to be derived by late merge of extraposed constituent to a silently displaced host.

coordination requires to postulate agreement in case to derive internal case marking on the head, which at least partially undermines my earlier claim that ICA does not result from Agree. Finally, movement of the DP (instead of the NP) provides a correct final structure, but raises issues regarding the restrictions on semantic interpretation. I will leave the choice between these options for further research.

4.4.4 Case mismatches

In this section, I will present the analysis of yet another property of relative clauses with ICA. As shown in section 2.5, under ICA a case marking on the head may differ from a case on the relative pronoun. The mismatch arises in contexts where the paradigm of the relative pronoun does not have a form that corresponds to the case assigned in the relative clause. The relative pronoun is then a complement of a postposition and is marked for the genitive case, but the head of the relative clause being a regular noun shows an oblique case unavailable for the relative pronoun. This phenomenon is illustrated in (86).

(86) NOM ← ABL
Pin'ə-**də** [**kona-n'** **ezdə** (/ *kona-də) mon pel'-an
dog-ABL which-GEN in.ABL which-ABL I[NOM] fear-NPST.1SG
aščˇ-i] ul'c'ɛ-t' kučka-sə.
be-NPST.3[SG] street-DEF.SG.GEN middle-IN
'The dog that I fear is standing in the middle of the street.'

These data seem to suggest that the choice between a case and a postposition is a matter of morphological realization (see Caha (2009), Svenonius (2012)). In that case, the head of the relative clause and the relative pronoun get the same set of features, but since the relative pronoun does not have a corresponding case form, the features are realized as a postposition plus a genitive marker on the pronoun (cf. Abramovitz (2021)).

This approach is problematic for the data in (87), showing that the head of the relative clause can in such cases be also marked for the genitive. If postposition plus genitive is merely a realization of case features in morphology, it is then unclear how the head of the relative clause acquires genitive.

(87) NOM ← GEN
Pin'ə-**t'** [**kona-n'** **ezdə** mon pel'-an aščˇ-i]
dog-DEF.SG.GEN which-GEN in.ABL I[NOM] fear-NPST.1SG be-NPST.3[SG]
ul'c'ɛ-t' kučka-sə.
street-DEF.SG.GEN middle-IN
'The dog that I fear is standing in the middle of the street.'

Another argument against a purely morphological account comes from the data in (88). They show that the 'attraction' of the postpostion is ungrammatical, i.e., the postposition cannot be duplicated in the main clause.

(88) NOM ← GEN + PP
*Pin'ə-**t'** **ezdə** [**kona-n'** **ezdə** mon pel'-an
dog-DEF.SG.GEN in.ABL which-GEN in.ABL I[NOM] fear-NPST.1SG
ašč-i] ul'c'ɛ-t' kučka-sə.
be-NPST.3[SG] street-DEF.SG.GEN middle-IN
'The dog that I fear is standing in the middle of the street.'

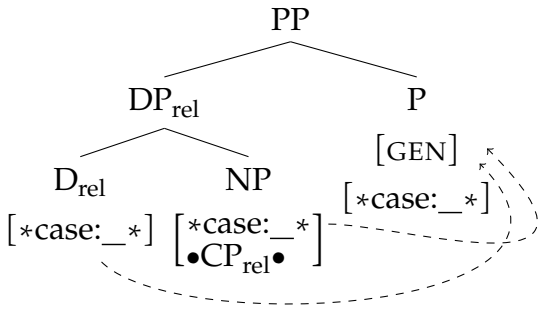
If a postposition were a morphological realization of some case features, then it would be expected that the features can be also realized in this way on the head, contrary to the facts. Example (89) further shows that the postposition plus the genitive marking is in principle available for regular noun phrases; see (89).

(89) Mon pel'-an pin'ə-**t'** **ezdə**.
I[NOM] fear-NPST.1SG dog-DEF.SG.GEN in.ABL
'I fear the dog.'

The lack of postposition attraction follows if postpostions are heads in syntax and thereby differ from case that is a morphological realization of features on a noun.[33]

I suggest that the different case markings on the head follow from different merge positions of the head NP, which in turn lead to case assignment from different heads. If the NP is merged with the relative pronoun, then its case probe is valued by the genitive feature from the postposition as shown in (90).

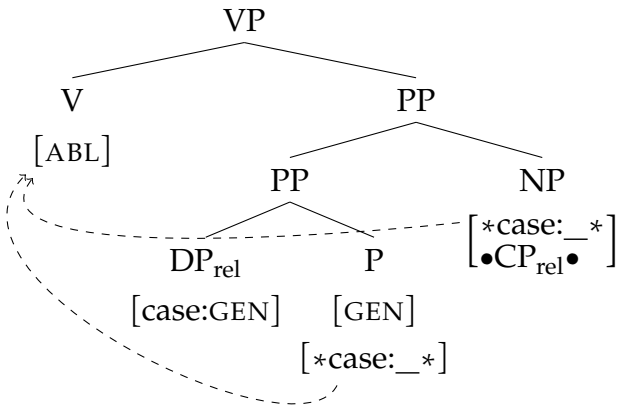
(90) Genitive from the postposition



If the head is merged directly with the postpositional phrase as shown in (91), it gets the ablative case from the verb. Note that the postposition in (86) is also marked for the ablative. The head noun thus acquires ablative case in parallel with the postposition. The relative pronoun still gets genitive from the postposition. This yields a mismatch between the case of the relative pronoun and the head.

[33] See, however, Pleshak (2022) for an analysis of nominal morphology in Moksha, according to which oblique cases also instantiate the P head in syntax.

(91) Ablative from the verb



Note that case mismatches are not restricted to contexts where the relative pronoun is a complement of a postposition: In example (92), the pronoun is marked for dative, while the head shows illative.

(92) NOM ← ILL
Lauka-**s** [**kona-n'd'i** (/ *kona-s) tu-s' mon'
store-ILL which-DAT which-ILL go-PST.3[SG] I.GEN
brada-z'ə] af kunarə panžə-v-s'.
brother-1SG.POSS.SG[NOM] NEG long.ago open-PASS-PST.3[SG]
'Store where my brother went opened recently.'

These data can be incorporated in the analysis in two ways. On the one hand, it can be assumed that the data in (92) are only different from those discussed above in that the postposition is silent. In this case, their analysis is identical to the one sketched above. On the other hand, since both dative and illative can be used to mark direction, the head and the relative pronoun may simply get different cases from a higher verbal head.

4.5 Summary

In this chapter I have presented the analysis of relative clauses with ICA in Moksha.

I have started with reviewing the syntax of raising and suggested that raising relative clauses are best derived by projecting movement of the head NP. I have then shown that projecting movement can be implemented by means of projection by selection labeling algorithm combined with the assumption that merge features can remain unchecked for some part of the derivation and probe upwards to find their goals.

I have then turned to the case marking on the head and suggested that internal or external case on the head of the relative clause follows from different orderings of the case probe and the merge feature that is satisfied upon movement of the head

to the main clause. Ordering of the case probe before the merge feature forces case assignment in the relative clause, while the reverse order requires for case assignment to be delayed until the head has moved to the main clause. This provides a novel perspective on case overwriting phenomena and accounts for them without involving an actual overwriting of a feature value.

Next, I have presented the analysis of the left periphery restriction for the relative clause with ICA. I have suggested that the left periphery restriction instantiates a forced ex-situ effect, i.e., a constituent that is legitimate at an intermediate stage of the derivation must be destroyed before the derivation terminates. I have proposed that such effects are derived under projection by selection labeling algorithm, if selection applies not just for the category, but also for further unsatisfied features. I call them second order selection features. To derive obligatory ex-situ position of relatives with ICA in Moksha, I have assumed that verbal / clausal heads in Moksha select for DPs with an active probe. This probe is usually the unvalued case feature, but since heads of relatives with ICA receive their case inside the relative CP, they must have another active probe to satisfy selection requirements in the main clause. This unchecked probe then leads to movement of the relative clause to the left periphery.

After this, I have shown how the remaining properties of relative clauses with ICA can be derived under this proposal. In particular, I have suggested that coordination of two relative clauses under one head involves coordination of relative CPs followed by the ATB-movement of the head out of one of the conjuncts. I have then shown that the ban on extraposition is typical for raising relatives and follows if extraposition is derived by late merge of an extraposed constituent to its silently displaced host. Since under raising the head is first combined with the relative clause and only then with the main clause, extraposition turns out to be impossible. Next, I turned to extraction out of the relative CP and suggested that the difference between relatives with external and internal case is derived if edge features in a DP are accessible only after it receives case, i.e., in time for extraction out of relatives with the internal case, but too late for relatives with the external case. I have next shown that the appositive interpretation in principle does not exclude the raising syntax and there are several ways to reconcile them. Finally, I have suggested that mismatches in case of the head and the relative pronoun follow from different first merge positions of the head inside the relative CP.

If this analysis is on the right track, it has the following implications for syntactic theory: First, Merge is feature-driven and the projection by selection algorithm underlies labeling. Second, syntactic objects can be selected before all their merge features are satisfied. Such unchecked merge features can probe upwards. Third, merge features select not only for a category, but also for further active features of syntactic objects. Fourth, features on syntactic objects are ordered and at least some of these orderings are determined language-specifically.

Chapter 5

Extensions and implications

5.1 Introduction

In this chapter I will explore extensions and theoretical implications of the analysis of relative clauses with ICA proposed in the previous chapter. The analysis relies on the approach to syntax where Merge is driven by features and a label of a newly created constituent is determined via projection by selection algorithm. Other core assumptions are that syntactic objects can be selected before all of their merge features are satisfied and that selection applies not only for a category, but also for further unsatisfied features. The former of these two assumptions is required to derive projecting movement that as I have suggested occurs when the unchecked merge feature finds its goal by upward search. The latter assumption introduces the second order selection features and they derive the obligatory ex-situ placement of syntactic objects. In the first two sections of the chapter I will talk about other phenomena the accounts of which require these assumptions.

In section 5.2, I start with an observation that there is a well-known case in syntactic theory, where merge features must remain unchecked until later in the derivation: late merge (see Lebeaux (1988, 1990), Takahashi & Hulsey (2009)). I assume that late merge applies when its target undergoes movement, in the course of which it is copied and merged to the workspace (see Nunes (2004), Heck (2022) and also Heck (2016)). This implementation arguably allows late merge to be compatible with the Strict Cycle Condition (see Chomsky (1973, 1995b, 2019)) and resolves the overgeneration problem pointed out by Sportiche (2019). A novel ingredient I am introducing to the account is that the delayed checking of a merge feature can follow from the ordering of the merge feature after an agreement feature. I then demonstrate how this approach applies to relative clauses for which it was widely argued that as adjuncts they can be late merged to their hosts.

Second, in section 5.3 I turn to the second order merge features. I show that the forced ex-situ effects that second order merge features intend to derive are a persistent pattern cross-linguistically. The first case of forced ex-situ comes from the split topicalization in German. Following Ott (2012, 2015), the derivation of

this phenomenon involves creating a syntactic constituent that is never observed in the resulting structure. Preserving Ott's main assumptions on the syntax of split topicalization, I show how his analysis can be recast under the projection by selection algorithm. I then argue that a number of further syntactic phenomena require an obligatory forced ex-situ position of a syntactic object. These are relative pronouns that can be used in raising relative clauses, but cannot form a constituent with the noun on the surface (see Aoun & Li (2003), Heck (2005), Salzmann (2014)), resumptive pronouns and doubled clitics that under the Big-DP approach must form an otherwise unattested constituent with displaced DPs (see Boeckx (2003)), and wager-class verbs that are known for being able to have a direct object only if it undergoes Ā-movement (see Postal (1974), Kayne (1984)). At the end of this section, I will once again briefly review the alternative approach based on Chomsky's algorithm (see Chomsky (2013, 2015) and show that it does not cover the full range of data.

In the final section 5.4, I address some existing criticism of the projection by selection labeling algorithm and briefly talk about other existing labeling algorithms. I show that the broad selection as well as adjunction can be handled by the algorithm if the presence of some merge features is optional. I then address an alleged conceptual issue that projection by selection is unmotivated and incompatible with the goals of minimalist syntax. I suggest that projection by selection can be reformulated to be compatible with an idea that labeling applies under Minimal Search: In case of labeling Minimal Search always finds two syntactic objects and the choice between them is made on the basis of their properties. A syntactic object that checks an active merge feature provides a label. I conclude that projection by selection labeling algorithm is superior both empirically and conceptually and must be therefore correct.

5.2 Late merge

Late merge is a theoretical tool used to derive anti-connectivity effects, i.e., cases where a syntactic object that corresponds to some position does not participate in syntactic or interpretational processes in this position. One of the well-known examples of anti-connectivity illustrates an obviation of condition C by a material inside a relative clause; see (1a). Relative clauses contrast with complement clauses as in (1b) which incur a violation of condition C connectivity; see section 3.3.5 for an overview on condition C.

(1) a. Which claim [that John$_i$ made] did he$_i$ later deny __ ?
b. *Whose claim [that John$_i$ likes Mary] did he$_i$ deny __ ?

Late merge provides a straightforward answer to a question why *John* in (1a) is not evaluated for condition C in the base merge position of the DP that contains the relative clause. This is because *John* together with the rest of the relative CP is not

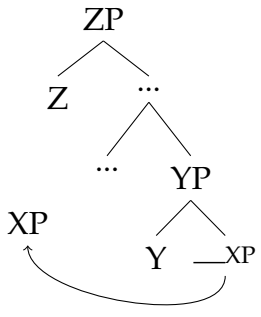
present in this position, but the relative clause is merged to the DP at a later step in the derivation. Late merge is extensively criticized for violating cyclicity: the Strict Cycle Condition (see (2)) as well as the Extension Condition (see (3)).

(2) Strict Cycle Condition:
Within the current domain δ, no operation may affect solely a proper subdomain γ that is dominated by δ. (based on Chomsky (1973, 1995b, 2019), see Müller (2011, 2014) for this formulation)

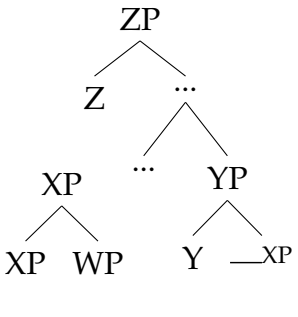
(3) Extension condition:
A syntactic derivation can only be continued by applying operations to the root of the tree. (see Chomsky (1993, 1995b) and Adger (2003: 75) for this formulation)

These conditions preclude Merge from applying in a proper subdomain of a given tree structure, but the analysis of condition C obviation by late merge requires the relative clause to be merged to the noun phrase after the latter is embedded and is therefore a proper subpart of the structure. The solution to this dilemma comes from the fact that all known cases of late merge involve movement of its host; cf. example (1a), where the noun phrase that is targeted by the late merge undergoes Ā-movement. Movement of the host enables an implementation of late merge compatible with the concepts of cyclicity in (2) and (3); see Nunes (2004), Heck (2022) and also Drummond (2010), Heck (2016). The basic idea is that movement proceeds by creating a copy of a displaced syntactic object in the workspace and this copy is not in the proper subdomain in the created structure. Merge features can then be discharged without violating cyclicity conditions. The derivation is sketched below.

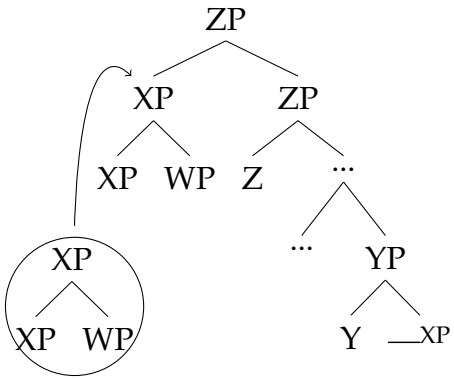
(4) Copy



(5) Late merge



(6) Merge

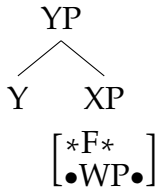


Given that all Merge operations are triggered by features, for late merge to be possible, the discharge of a merge feature must be delayed and a syntactic object must be selected before its own selection features are checked. This requirement is common for late merge and projecting movement for which it is also necessary that a merge feature remains unchecked until later in the derivation. In order to ensure

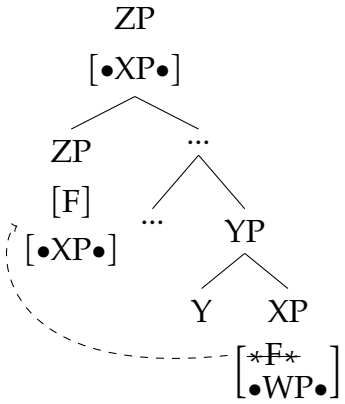
this for projecting movement, I have suggested in section 4.2.2 that relative pronouns select for NPs with an active merge feature. Here I would like to propose that the delayed discharge of merge features can also follow from the general organization of features in stacks: For a merge feature to avoid early checking, it must be ordered after an agree probe and this agree probe is satisfied only later.[34]

The structures below show the revised derivation of late merge. In (7), XP enters the derivation with an unchecked agreement probe and merge feature that is ordered after this agreement probe and consequently cannot be discharged before the agreement probe. In (8) the goal for the agreement feature enters the derivation, so that the probe finds its goal by upward search and gets checked.

(7) Features

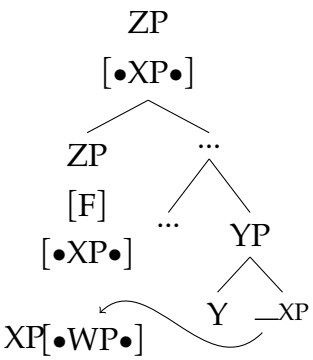


(8) Agree

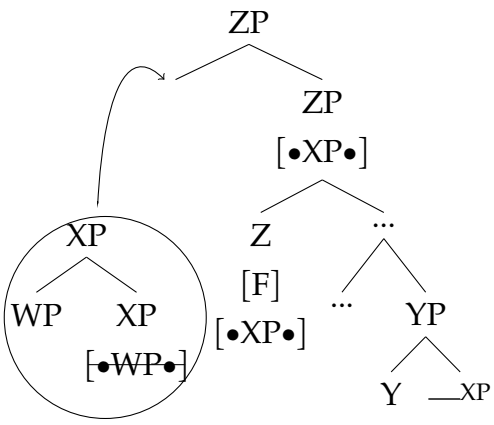


XP has the merge feature on the top of the stack and the phrase is attracted by ZP. In the course of movement, XP is merged to the workspace, where its selection feature can be discharged without violating cyclicity; see (9)-(10).

(9) Copy



(10) Late merge of XP



As already mentioned above, relative clauses obviate condition C and are one of

[34] Heck (2016, 2022) assumes that the delayed checking of merge features follows from Procrastinate, which explicitly forces features to remain active longer than independently required by the derivation.

the textbook examples of late merge (see Lebeaux (1988, 1990), Hulsey & Sauerland (2006), Takahashi & Hulsey (2009), and also most recently Bhatt & Nash (2022)). The effect is also attested in Moksha. Examples (11) and (12) show that the material inside the relative clause is not evaluated with respect to condition C in the main clause. Examples differ in the case marking on the head: It is marked for the external case in (11) and for the internal case in (12).

(11) Pin'ə-t'i [kona-n' **Pet'ɛ$_i$** rama-z'ə] **son$_i$**
dog-DEF.SG.DAT which-GEN Petja[NOM] buy-PST.3SG.O.3SG.S PRON.3SG
maksi jaŕca-ma-t'.
give.NPST.3SG.O.3SG.S eat-NZR-DEF.SG.GEN
'To the dog Petja bought he is giving food.'

(12) DAT ← GEN
Pin'ə-**t'** [kona-n' **Pet'ɛ$_i$** rama-z'ə] **son$_i$**
dog-DEF.SG.GEN which-GEN Petja[NOM] buy-PST.3SG.O.3SG.S PRON.3SG
maksi jaŕca-ma-t'.
give.NPST.3SG.O.3SG.S eat-NZR-DEF.SG.GEN
'To the dog Petja bought he is giving food.'

Recall that as shown in section 2.3.2 both types of relative clauses allow for anaphor binding into the head as well as variable binding into CP in their base position. This confirms that relative clauses originate in an argument position in the main clause, not base generated on the left. Late merge of a relative clause must be then optional. These data however also suggest that late merge is possible for relative clauses with ICA and must be thus compatible with the raising structure. This is surprising given that under this derivation the head moves out of the relative CP and therefore cannot be merged with the relative main clause material before it merges with the relative CP. This excludes the late merge of the relative CP and was used in section 4.4.1 to derive the ban on extraposition of relative clauses with ICA.

To resolve this controversy, Takahashi & Hulsey (2009) suggest that it is not the relative CP, but the whole NP that is late merged to the external D head. Combined with the suggestion that the delayed valuation of a merge feature is possible because of the feature order, this means that the D head in (12) has the following features, where [∗Ā∗] stands for any Ā-related probe (e.g., [∗Q∗] or [∗top∗])

(13) D
$\begin{bmatrix} *\bar{A}* \\ \bullet NP\bullet \\ *case:\_* \end{bmatrix}$

The ordering ensures that the NP that includes the relative clause is late merged to the D head in the course of its movement to the left. The D head also has a case probe ordered after the selection feature for NP. This allows it to get case from the NP that in turn gets case inside the relative CP. Note that this analysis is compatible with the analysis of the left periphery restriction that applies to relative clauses with

ICA: Since the D head here is merged to the main clause before before it is merged with the NP and gets case from it, selection requirement of the verbal / clausal head that there is an active agree feature is fulfilled by a case probe alone. The Ā-related probe is however necessary, so that the NP can be late merged. This Ā-related probe ensures that the DP with the relative clause appears at the left periphery in the end of the derivation.

For relatives with external case that are derived by the head-external structure (see chapter 3), late adjunction of the relative CP is possible.[35] The question that I leave open is whether late adjunction of the NP is as well possible for these relatives. Following Takahashi & Hulsey (2009) (see also Keine & Bhatt (2019) and Gong (2022)), the NP must be present in the position of case assignment. This blocks late merge of NPs if movement targets a position where no case is assigned. However, the restriction does not seem to hold for raising relatives in English, for which late merge was claimed to be possible.

To sum up, the delayed discharge of the merge features can lead to two different patterns: projecting movement attested in the raising derivation of relative clauses and late merge. In this section, I have suggested that the delayed saturation of the merge feature in the case of the merge can follow from the ordering of a merge feature after an agreement probe that finds its goal only later in the derivation. I have then discussed late merge in Moksha relative clauses and shown that condition C obviation by raising relatives can be accounted for if the NP rather than the CP is late merged.

5.3 Second order merge features

In this section, I will turn to the second order selection features. They derive forced ex-situ effects, under which some constituent is required at an intermediate stage of the derivation, but is never attested in the resulting structure. In this section, I will present four other phenomena that instantiate a forced ex-situ effect and show how second order merge features account for them.

5.3.1 Split topicalization

The first case comes from split topicalization. This is a phenomenon under which the noun phrase appears to be split between its base position and some higher position. Split topicalization is attested in a number of languages (see Fanselow & Féry (2006)). Here I will consider split topicalization on the basis of German data; see (14).

(14) **Bücher** hat Peter leider erst **drei** **gute** gelesen.
books has Peter unfortunately only three good read

[35] This further predicts that if a relative clause with the external case obviates condition C, it must be appositive.

'As for books, Peter has unfortunately only read three good ones.'
(Ott 2015: 157)

While split topicalization has been subject to intensive research (see Fanselow (1988), Van Riemsdijk (1989), Fanselow & Ćavar (2002) among other), here I will focus on the study by Ott (2012, 2015), who argues that the derivation of split topicalization involves building a constituent that never appears on the surface and therefore must break down before the derivation terminates, i.e., split topicalization in German demonstrates a forced ex-situ effect. The argumentation for this view is twofold: First, it must be shown that the construction involves movement. Second, the required base generated constituent must never occur in the resulting structure, i.e., it must be impossible to reduce to split topicalization to subextraction out of a regular noun phrase. I will briefly summarize arguments for these claims.

Arguments for movement as opposed to base generation come from locality restrictions, connectivity effects and licensing of parasitic gaps. Starting with locality restrictions, the data in (15) show that split topicalization is ungrammatical if the base position of the noun phrase is inside the adjunct island. The restriction follows naturally if the construction involves movement.

(15) *__Bücher__ war Peter traurig [nachdem seine Mutter __viele__ weggeworfen
books was Peter sad after his mother many thrown.away
hatte].
had
'As for books, Peter was upset after his mother threw many of them away.'
(Ott 2015: 168)

A further piece of evidence in favor of movement comes from anaphor binding (see (16)). It shows that the constituent on the left periphery can be bound by the material that c-commands the noun phrase in its base position, but not on the left.

(16) __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, man never wrote any.' (Ott 2015: 168)

The final argument for movement shows that split topicalization can license parasitic gaps. This is typical for Ā-movement, but not for constituents base generated on the left.

(17) __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 of them though knowing them' (Ott 2015: 170)

I thus conclude that split topicalization in German involves movement and turn to

the data showing that the constituent required in the base position is not a regular DP. The first piece of evidence comes from the data given in (18). Example (18a) contains split topicalization and the adjective in the dislocated position shows strong inflection. Example (18b) shows that the strong inflection is ungrammatical without movement. This suggests that split topicalization cannot be reduced to extraction out of an otherwise grammatical noun phrase.

(18) a. **Polnische** **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 **polnischen** Gänse (/ *keine
she has no.STRONG Polish.WEAK geese no.STRONG
polnische Gänse) gekauft.
Polish.STRONG geese bought
'She did not buy any Polish geese.' (Ott 2015: 161)

Being based on the adjectival agreement this argument seems to be fairly weak, because differences in morphological marking of nominal modifiers can be arguably derived morphologically and depend on its immediate environment (cf. Murphy (2018)). The argument can be strengthened: Example (19) shows that the indefinite determiner can be duplicated in both parts of the split noun phrase.

(19) **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.' (Ott 2015: 161)

Example (20) further shows the duplication of the preposition:

(20) **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.'
(Ott 2015: 162)

A different piece of evidence against subextraction is given in (21)-(22). The data in (21) show that in noun phrases that are modified by a relative CP and by a PP, the PP obligatorily precedes the relative clause. Example (22) illustrates split topicalization where the noun and the relative clause, but not the PP are on the left; that is, the extracted syntactic object is not a constituent under the regular DP structure.

(21) 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

(22) **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.'

(Ott 2015: 162)

The final argument against deriving split topicalization by subextraction out of regular DP comes from gapeless splits under which a topicalized constituent and a consitutent in situ both contain a full DP; see (23)-(24).

(23) **Seltene Raubvögel** hat Jürgen nur **ein paar** **Bussarde** gesehen.
rare birds.of.prey has Jürgen only a couple buzzards seen
'As for rare birds, Jürgen only saw a couple buzzards.'

(24) **Zeitungen** liest Maria nur **die 'junge Welt'**.
newspapers reads Maria only the young world
'As for newspapers, Maria reads only 'Junge Welt'. (Ott 2015: 165)

Thus, I conclude that the nominal constituent in the base position and the topicalized constituent are two autonomous noun phrases, which are however both associated with one base position. Ott (2012, 2015) further notes that the topicalized noun phrase is always property-denoting (see (25)) and on this basis concludes that the topicalized constituent is an NP. He suggests that the constituent remaining in-situ is a DP that in some, but notably not in all cases contains an elided noun.[36]

(25) a. **Ein neues Auto** kann ich mir leider **kein richtig schickes**
a new car can I me unfortunately no really fancy
leisten.
afford
'As for a new car, I unfortunately cannot afford a really fancy one.'

b. *__Das Auto__ kann ich mir nur **das neue von BMW** leisten.
the car can I me only the new by BMW afford
Intended: 'As for the new car, I can only afford the new one from BMW.'
(Ott 2015: 170)

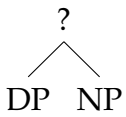
Combined with an earlier conclusion that split topicalization in German involves movement, this implies that the topicalized NP merges with DP in its base position, but this constituent is never preserved till the end of the derivation. The data thus present a clear case of the forced ex-situ effect.

Ott (2012, 2015) provides the analysis of this phenomenon that is based on the labeling algorithm developed by Chomsky (2013, 2015), which was summarized in section 4.3.2. This analysis builds on the assumption that labeling applies under Minimal Search, which fails to find a unique label if two phrases that do not agree with each other are merged. In this case, one of the merged phrases must undergo further movement and the remaining one provides a label. The structures below show how this approach applies to split topicalization in German. In (26), the DP

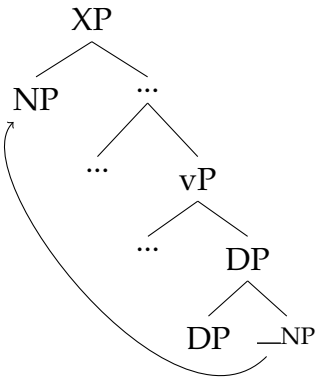
[36] Ott contends that NP must function as a predicate of the DP and that the interpretation is possible only if the constituents have these labels. This has implications for the analysis of prepositions and indefinite articles, which can be part of the topicalized constituent: Prepositions are suggested to be a morphological realization of lexical cases and indefinite articles must be N-level elements.

and the NP merge, but no label can be found. (27) shows that the DP labels after the NP has moved out.

(26) Unlabelable structure

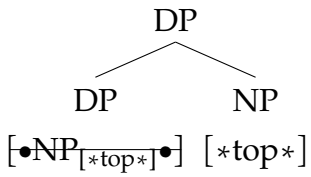


(27) Movement and labeling



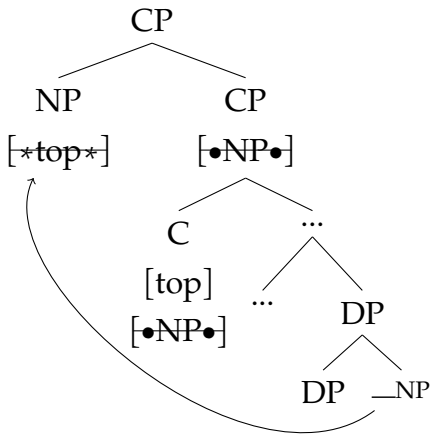
While the analysis derives split topicalization in German, it cannot be extended to the obligatory ex-situ position in Moksha relative clauses as shown in section 4.3.2 even though they show a very similar pattern. The approach proposed for Moksha, on the contrary, applies to the split topicalization data. The single necessary assumption is that the DP is built, it can select for yet another NP only if this NP has the unchecked [∗top∗] probe; see (28).

(28) Merge



The active [∗top∗] feature is then checked by the higher head (e.g., the C head), which then also attracts the NP to its specifier; see (29).

(29) Movement



5.3.2 Relative pronouns

Another instance of forced ex-situ effects comes from relative pronouns. As noted by Aoun & Li (2003), some of the relative pronouns in English typically do not form a constituent with an overt noun; see (30)-(31).

(30) a. the boy **who** was late
b. *__Who__ boy was late?

(31) a. the reason why he left
b. *Why reason did he leave?

The same observation was made for German by Heck (2005); see (32)-(33).

(32) 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 my friends.'

(33) a. das Problem, **das** du gesehen hast
ART problem which.N you seen have
'the problem that you saw'
b. ?das Problem, **was** du gesehen hast
ART problem what you seen have
'the problem that you saw'
c. *Du hast **was** Problem gesehen?
you have what problem seen
'What problem did you see?'

If it can be shown that these relative clauses are derived by raising, then their

derivation must include a step where a relative pronoun merges with a head of the relative clause thereby building a constituent that is illegitimate in the resulting structure as shown above. For German, Heck (2005) suggests that relative clauses as in (32)-(33) show connectivity with a position inside the relative CP. He however uses variable binding as a diagnostic, while in chapter 3 I have argued that variable binding is unreliable for diagnosting the relative clause structure. In what follows, I will present the data from Moksha showing that relative pronouns that do not form a constituent with a noun in the resulting structure are grammatical in raising relative clauses as well.

Example (34) shows that *kijə* 'who' can be used as a relative pronoun in relatives with internal case.

(34) NOM ← GEN
Loma-t'n'ə [**ki-t** er'ɛ-j̊-t' marṭə-nək] mon
person-DEF.PL[NOM] who-PL[NOM] live-PST.3-PL with-POSS.1PL I[NOM]
tɛči iz'-in'ə n'ɛjə.
today NEG.PST-PST.3.O..1SG.S see.CN
'Today I didn't see people who lived with us.'

Data in (35) illustrate that *kijə* cannot form a constituent with a noun in correlatives.

(35) *[**Ki-t** **loma-t'n'ə** / ***kijə** **loma-t'n'ə** er'ɛ-j̊-t'
who-PL person-DEF.PL[NOM] who person-DEF.PL[NOM] live-PST.3-PL
marṭə-nək] mon tɛči iz'-in'ə n'ɛjə
with-POSS.1PL I[NOM] today NEG.PST-PST.3O.1SG.S see.CN
Intended: 'Today I didn't see people, who lived with us.'

The same restriction is attested in questions; see (36).

(36) ***Ki-t** **loma-t'n'ə** / ***kijə** **loma-t'n'ə** er'ɛ-j̊-t'
who-PL person-DEF.PL[NOM] who person-DEF.PL[NOM] live-PST.3-PL
marṭə-n't'ə?
with-POSS.2PL
Intended: 'Who lived with you?'

Another pronoun showing the same pattern is *kozə* 'where'. Data in (37) show that it can be used in relatives with ICA.

(37) NOM ← DAT
Oš-t'i [**kozə** min' vandi mol̥'-t'amə] stroja-f
Village-DEF.SG.DAT where we tomorrow go-NPST.1PL build-PTCP.RES
kimgotuvə-c'ə vek-t' ezdə.
sixteen-ORD century-DEF.SG.GEN in.ABL
'The village where we are going tomorrow was build in the sixteenth century.'

This pronoun however cannot be used in correlative clauses (see (38)) and questions (see (39)).

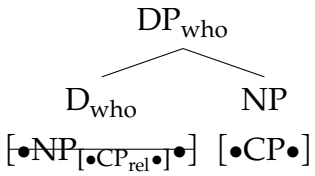
(38) *[**Kozə oš-t'** min' vandi mo̝l'-t'amə] son
where village-DEF.SG.DAT we[NOM] tomorrow go-NPST.1PL PRON.3SG
stroja-f kimgotuvə-c'ə vek-t' ezdə.
build-PTCP.RES sixteen-ORD century-DEF.SG.GEN in.ABL
Intended: 'The village, where we are going tomorrow, was build in the sixteenth century.'

(39) ***Kozə oš-t'i** / ***kozə vastə-t'i** min' vandi
where village-DEF.SG.DAT where place-DEF.SG.DAT we[NOM] tomorrow
mo̝l'-t'amə?
go-NPST.1PL
'Where we are going tomorrow?'

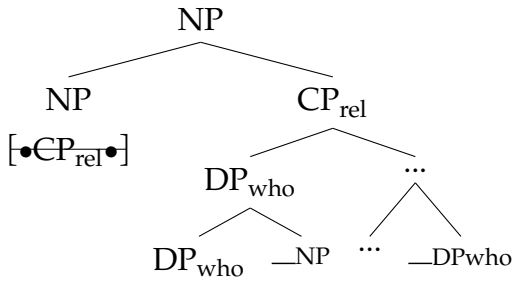
To sum up, the data show that relative pronouns 'who' and 'where' in Moksha can be used in raising relative clauses. Since the raising derivation includes a step where a head noun phrase is merged with the relative pronoun inside the relative CP, this means that these pronouns can in principle form a constituent with a noun. The data of correlative clauses and questions show that such a constituent is never grammatical in the final structure. Relative pronouns thus are yet another case of forced ex-situ effects.

The data follow from the proposed account involving second order selection features if pronouns 'who' and 'where' in Moksha select for NPs with an active [•CP•] feature. Structure (40) shows the first step in the derivation, where the pronoun merges with the noun. The merge feature ensures that the NP moves out yielding the structure in (41). Note that the relative pronoun also moves to the left of the relative clause.

(40) Merge

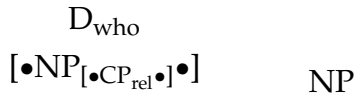


(41) Movement



If the NP does not have an active merge feature as it is the case in correlatives and questions, then the selection requirement of the pronoun cannot be fulfilled; see (42). In result, the relevant pronouns cannot merge with NPs that intend to stay in-situ.

(42) Merge is not possible



Recall also that in section 4.2.2 I have assumed that in fact all relative pronouns select for an NP with an unchecked merge feature. I suggested that this is required to ensure that the merge feature on NP is not discharged before it is merged with the relative pronoun. At the same time, the data in (43) and (44) show that regular relative pronoun *kona* 'which' can be used in correlatives and in questions.

(43) [**Kona jalga-z'ə-n'd'i** t'aš-n'ə-n'] mon
which friend-1SG.POSS.SG-DAT write-FREQ-PST.1SG I[NOM]
n'ɛj-sa son' kurək.
see-NPST.3SG.O.1SG.S PRON.3SG.GEN soon
'I will soon see my friend to whom I have been writing.'

(44) **Kona jalga-z'ə-n'd'i** mon t'aš-n'ə-n'?
which friend-1SG.POSS.SG-DAT I[NOM] write-FREQ-PST.1SG
'To which friend I was writing?'.

A major difference between correlatives and questions on the one hand and externally-headed relative clauses on the other hand is that in latter the relative pronoun is also marked for case; see (45).

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

I suggest that the relative pronoun *kona* 'which' can in principle have one of the two feature stacks: In the first case, it selects for an NP with an active merge feature and has an unvalued case probe; see (46). Relative pronouns with these features are used in the externally-headed relative clauses. In the second case, the relative pronoun selects simply for an NP and does not have a case probe (see (47)). It is then used in correlatives and questions.

(46) Case probe
D_{which}
$\left[\begin{matrix}\bullet NP_{[\bullet CP_{rel}\bullet]}\bullet \\ *case:\_*\end{matrix}\right]$

(47) No case probe
D_{which}
[•NP•]

Note that in addition to the features illustrated above, feature stacks also have probes targeting corresponding C heads such as, for instance, [∗Q∗] in questions and [∗rel∗] in externally-headed relative clauses. This excludes the use of (46) in questions as well as (47) in headed relative clauses.[37]

[37] I further assume that the feature deriving movement to the left in correlatives differs from the one in headed relative clauses.

5.3.3 Big-DP analysis

The next case of forced ex-situ comes from the Big-DP analysis of movement resumption and clitic doubling. According to this approach, syntactic objects such as resumptive pronouns and clitics are base generated attached to the DP, even though this constituent is never attested in the resulting structure. In this section, I will briefly review some of the arguments suggested in favor of this approach and sketch an analysis of why the constituent required at an intermediate stage of the derivation never appears on the surface.

I will start with the resumption. Example (48) illustrates a resumptive pronoun in Hebrew. Here, the pronoun *ʔoto* can optionally appear in the base position of the noun phrase, which surfaces in some other position in this sentence.

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

The analyses of resumption differ in whether a syntactic object the position of which is occupied by the resumptive pronoun is base generated in this position (see Aoun, Choueiri, & Hornstein (2001), Boeckx (2003), Klein (2016)) or elsewhere (see Sells (1984), McCloskey (1990), Adger & Ramchand (2005)).

Evidence in favor of movement comes from the fact that a DP can show connectivity effects with the position filled in by a resumptive pronoun. One of such data points comes from the condition C violation and was studied by McCloskey (1990) for Irish and later by Shlonsky (1992) and Boeckx (2003) for Hebrew. Hebrew data are presented in (49)-(50). The first example does not involve movement, but shows that the epithet can c-command a coreferent pronoun without ungrammaticality. The second example shows that if the same position is filled by the resumptive pronoun corresponding to the noun phrase higher in the sentence, this leads to ungrammaticality. This result is expected if the resumptive pronoun marks the launching position of a movement dependency and the DP was in fact present in this position earlier in the derivation. Example (50) is then ungrammatical due to condition C violation: The epithet c-commands the coreferent DP in the base structure.

(49) Yidaʕ ʔet **ha-ʔidiot$_i$** [še ha more yaxšil **ʔoto$_i$**].
I.informed ACC the-idiot that the teacher will.flunk him
'I informed the idiot that the teacher will flunk him.'
(Boeckx 2003: 20)

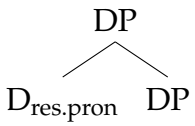
(50) *Ze ha **baxur** [še yidaʕti ʔet **ha-ʔidiot$_i$** [še ha more
this.is the guy that I.informed ACC the-idiot that the teacher
yaxil **ʔoto$_i$**]].
will.flunk him
'This is the guy that I informed the idiot that the teacher will flunk.'

Note that example (50) shows the dependency into the island structure, which can in principle be the reason for ungrammaticality. Example (51) however shows that such dependencies in Hebrew are in general grammatical in the presence of the resumptive pronoun.

(51) Ra?iti ?et **ha-yeled** [?ašer/?e-ha-cayad harag ?et ha-arie
saw.I ACC the-child COMP-the-hunter killed ACC the-lion
[?ašer/še-radaf **?axarav**]].
COMP-chased after.him
'I saw the child that the hunter killed the lion that chased (him).'
(Boeckx 2003: 20)

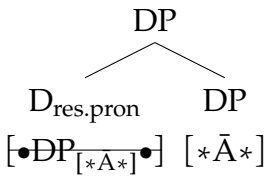
Thus, there are data confirming that a displaced DP and a resumptive pronoun occupy the case position before movement. One of approaches allowing this is the Big-DP analysis (see Aoun et al. (2001), Boeckx (2003), Daskalaki & Mavrogiorgos (2013)). According to it, the resumptive pronoun and the DP are merged together in their base position forming the big DP; see (52).

(52) Big DP

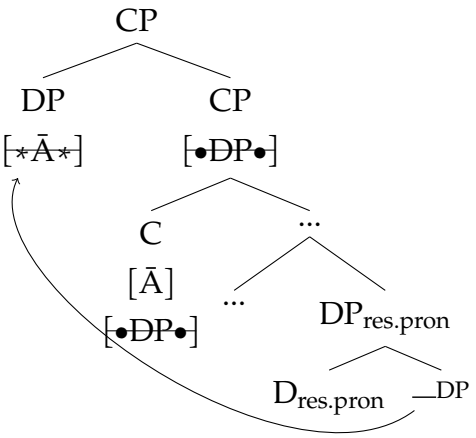


A common criticism of this approach is that the resumptive and the noun phrase never appear as a constituent of the surface. From the perspective advocated here, this is not a drawback, but another instance of the forced ex-situ effect. The data are captured if the resumptive D head selects for DPs with an active Ā-probe; see (53). This probe indicates that the DP will undergo movement (see (54)), so that the constituent as in (52) will never surface.

(53) Forced ex-situ for big DP



(54) Movement



The Big-DP approach is not restricted to resumptives, but it also applies to clitic doubling (see Uriagereka (1995), Roberts (2010), and Nevins (2011)). The phenomenon is illustrated in (55) from Rioplatense Spanish. In this example, the object is represented by both the proper name and the preverbal pronoun.

(55) **Lo** vimos a Juan.
Him we.saw a Juan
'We saw Juan' (Jaeggli 1986: 32)

Similarly to the resumptive pronouns, approaches to clitic doubling differ in whether the phenomenon involves movement or not. One of the arguments in favor of the movement approach was presented by Anagnostopoulou (2003) for clitic doubling in Greek and is repeated in (56)-(57). The data in (56) show that variable binding in Greek is sensitive to the c-command (at least in such simple sentences).

(56) a. **Kathe mitera$_i$** sinodhepse to pedhi **tis$_i$**.
every mother-NOM accompanied the child.ACC hers
'Every mother accompanied her child.'

b. ?*I mitera **tu$_i$** sinodhepse to **kathe pedh$_i$**.
the mother.NOM his accompanied the every child-ACC
'His mother accompanied every child.' (Anagnostopoulou 2003: 207)

The example in (57) constitutes a minimal pair with example (56b) and differs by the presence of the clitic. The clitic enables the bound variable interpretation that was ruled out in (56b).

(57) I mitera **tu$_i$** *to* sinodhepse to **kathe pedh$_i$**.
the mother.NOM his CL.ACC accompanied the every child-ACC
'His mother accompanied every child.' (Anagnostopoulou 2003: 207)

Given that agreement usually has no effect on binding, these data suggest that clitic

doubling involves movement to a position that c-commands the subject at least in its base position inside the vP. As a result, the analysis of clitic doubling requires base generation of the doubled clitic and the DP in the same position. This once again produces the structure that does not appear on the surface and thus instantiates the forced ex-situ effect. The account based on the second order selection features can derive the effect if DPs can select for the clitic D head only if the later has an active feature that needs to be discharged and leads to movement. As clitic doubling was related to interpretative effects (see Suñer (1988), Anagnostopoulou (1994)), I would like to suggest that the doubled clitic bears a corresponding information-structure probe (e.g, the topic probe) that must be discharged in a higher position.

5.3.4 Wager-class verbs

The final instance of the forced ex-situ effect comes form the wager-class verbs (see Postal (1974), Kayne (1981), i.a.).[38] These verbs are attested in a number of languages and they are peculiar in that they allow for an overt subject of the embedded infinitival clause only if this subject undergoes further movement. The phenomenon is illustrated in (58) from French and (59) from English. The sentences in (58a) and (59a) show that overt subjects of the infinitival clauses are ungrammatical if they follow the main clause verb. Sentences in (58b) and (59b) show that the corresponding examples are grammatical if subjects undergo Ā-movement.

(58) 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)

(59) a. *John wagered **Mary** [to have entered the room].

b. Mary, **who** Bill wagered [to have won the race]. (Pesetsky 1991: 16-17)

I assume that the infinitival T head does not assign nominative, so that its subject must get case from the verb of the higher clause. For case assignment from the higher clause it is required for the DP to move to the object position there (see McCawley (1970), Postal (1974)). Under these assumptions, the data of wager-class verbs can also be derived by second order selection features: I suggest that wager-class verbs modified by infinitives select only for DPs with an active Ā-probe. This derives further movement of infinitival subjects.

Note that in the absence of the infinitival complement, direct objects of wager-class verbs can remain in-situ:

(60) John wagered **his fortune** on the absence of c-selection. (Pesetsky 1991: 16)

[38] I am grateful to Coppe van Urk for pointing out this case to me.

This implies that such verbs can select for DPs in principle, but must select for DPs with an active Ā-probe if they also select for a TP; cf. the two possible feature stacks in (61) and (62).

(61) V with a direct object

V

[•DP•]

(62) V with a TP complement

V

$\begin{bmatrix} \bullet TP \bullet \\ \bullet DP_{[*\bar{A}*]} \bullet \end{bmatrix}$

Some languages also allow for passivization to salvage subject of infinitives with wager-class verbs; see (63) from English.

(63) **Mary** was wagered [to have won the race]. (Pesetsky 1991: 16)

I suggest that as DPs do not need to get case in the object position in this case, they do also not undergo raising to object, but raise to their final position directly from their base position in the infinitival TP. As a result, such analysis is inaccessible for Ā-moved phrases, because upon Ā-movement they cannot get case and the derivation fails then.

5.3.5 Summary and the alternative

In this section, I have shown that the obligatory ex-situ position of a syntactic object found in relatives with ICA in Moksha is a well-attested effect. In particular, I have suggested that it is instantiated by the following phenomena: split topicalization, relative pronouns, resumptive pronouns, clitic doubling, and wager-class verbs.

Note that this list is by far not complete. There are at least two further cases. One of them comes from quantifier floating; see (64). This case is considered by Ott (2012, 2015) as well as by Al Khalaf (2019) and follows from the analysis developed here if the QPs only select for DPs with unchecked probes.

(64) **Den Kindern** habe ich **beiden** geholfen.
the children.DAT have I all.DAT both.DAT helped
'I helped both children.' (Ott 2015: 190)

Yet another phenomenon that can be arguably viewed as a forced ex-situ effect is obligatory movement of subjects from Spec,vP to Spec,TP attested in some languages; see the schematic representation in (65).

(65) Subject movement

$[_{TP}\ DP_{subj}\ T\ [_{vP}\ \_\_DP_{subj}\ vP\ ]\ ]$

This case is discussed by Chomsky (2015) where it is suggested that his non-deterministic labeling algorithm can account for this movement without employing a conceptually unattractive [EPP]-feature. Since the approach pursued here assumes that all cases of Merge are feature-driven, it is not possible to exclude the probe attracting the DP to the higher position. The account based on secondary selection features is however also possible: It requires the assumption that the v head selects for DPs with an unchecked case feature (or with any active feature, as suggested in chapter 4 for languages with ICA) and that as a result of case assignment, DPs must move to T that provided case.

I will now once again talk about this existing alternative approach to forced ex-situ placement of syntactic object. It is based on the recent Chomsky's labeling algorithm (see Chomsky (2013, 2015) that was summarized in section 4.3.2. Under this approach, the source of the obligatory displacement is the inability to label a constituent unless one of the merged syntactic objects moves out, so that the remaining one can provide a label. There are two preconditions for the application of this approach: First, none of the merged syntactic objects must be terminal, because it will be taken as a label. Second, merged syntactic objects must not agree with each other, because the shared feature will label. In section 4.3.2, I have shown that these prerequisites are not fulfilled in case of obligatorily displaced relatives with ICA in Moksha.

Similarly, not all of the phenomena considered in this section satisfy these requirements. The first requirement is violated by relative pronouns, resumptives, and clitics. They involve Merge of a terminal with a phrase in the base structure and consequently no problem for labeling is expected: The terminal labels in this case.

There is one scenario under which a terminal cannot provide a label: it is weak. In this case, however, movement of its complement as it is required in the derivation with relative and resumptive pronouns is not expected to facilitate labeling, because the terminal will remain weak and unable to label. On the contrary, weak heads must be accompanied by further material that strengthens them and allows to label (see Chomsky (2015), Miyagawa, Wu, & Koizumi (2019), and Blümel (2022)). Furthermore, while the connection between the presence of features on the head and its strength is not formalized, known cases of weak heads (e.g., roots and T heads in some languages) differ in that they have no features of their own and they are strengthened by gaining features via feature inheritance and agreement. In cases discussed here, the relevant heads are the D heads that have case and number features.

Next, raising to object involved in the derivation of the wager-class verbs is discussed by Chomsky (2015: 10) and explicitly suggested to raise no problems for labeling: On the contrary, raised direct objects are claimed to strengthen verbal roots and allow them to project.

As for the second prerequisite, merged phrases creating an unlabelable constituent share features in essentially all of the considered cases. For instance, resumptives, relative pronouns, and clitics often have the same number and gender features as the

noun phrase they merge with. In all of these cases as well as in split topicalization, merged syntactic objects have the same case feature. These shared features may however not count for the Chomsky's labeling algorithm, because they are not necessarily acquired by Agree between the heads of the two merged phrases, but may be either independently present on both or result from multiple agreement with a higher head (cf. Hiraiwa (2001)). However, the assumption that only features shared via Agree between the heads of merged phrases count for labeling raises questions: It is unclear how the origin of the features can be traced. Agree and labeling cannot apply simultaneously, because labeling needs to have access to the outcome of Agree. But if labeling applies after Agree, it is impossible to determine the source of the features, at least under the standard assumptions. It is thus unclear how the requirement for Agree before labeling by a shared feature can be implemented and it also seems to contradict the general idea of this labeling algorithm to reduce labeling to Minimal Search and third factor principles (see also Murphy & Shim (2020) for arguments against labeling by a shared feature).

All in all, I conclude that Chomsky's labeling algorithm in its current form does not capture all attested cases of forced ex-situ. In contrast, all known cases of forced ex-situ effect can be derived by second order selection features.

5.4 Labeling: An outlook

The proposal in this dissertation assumes the projection by selection labeling algorithm and shows that despite its arguable simplicity it allows to account for non-trivial syntactic effects such as projecting movement and forced ex-situ effects. In this final section, I will take a step back and talk about labeling procedures in general. In section 5.4.1, I go through four alternative labeling proposals: labelless syntax pursued by Collins (2002), Seely (2006), Collins & Seely (2020), non-deterministic labeling algorithm by Chomsky (2013, 2015), exocentric labeling by Adger (2012), and the feature percolation approach suggested by Zeijlstra (2020), I will not be able to give justice to each of these proposals, but will outline the main idea as well as some arising issues. Then, in section 5.4.2, I will briefly review main criticisms and problems of the projection by selection labeling algorithm. In result, I conclude that this labeling algorithm has a better empirical coverage and is conceptually superior to the alternatives.

5.4.1 Alternative labeling proposals

Labelless syntax

Throughout this dissertation I have assumed that labeling is an inherent part of syntactic computation. The alternative developed by Collins (2002), Seely (2006), Collins & Seely (2020) as well as more recently by Narita (2011, 2014) is that labels

are not needed and the difference between heads and their dependents arguably required for determining how a derivation proceeds can be established by other means.

Here I will consider one such model suggested by Collins (2002). In this model, Merge is assumed to be driven by features, but labeling as such is absent and replaced by three principles. The first one is the Locus Principle given in (66). It ensures that all unsaturated selection features of a syntactic object are checked before another syntactic object with active features can be drawn from the numeration.

(66) Let X be a lexical item that has one or more probes/selectors. Suppose X is chosen from the lexical array and introduced into the derivation. Then the probes/selectors of X must be satisfied before any new unsaturated lexical items are chosen from the lexical array. Let us call X the locus of the derivation. (Collins 2002: 46)

Note that the Locus Principle in its current form raises problems for the branching specifiers which must be constructed in parallel with the main projection line. Also, excluding selection of syntactic objects before all their selection features are discharged, the principle excludes projecting movement in favor of which I have argued in the previous chapter. Let's however put these difficulties aside and proceed with the other two principles of labelless syntax.

The second principle is Minimality given in (67) and it is accompanied with the intervention condition in (68).

(67) Minimality:
Let P be a probe and G be a matching goal. Then P and G satisfy minimality if there is no G' matching P such that P asymmetrically c-commands G' and G' asymmetrically c-commands G. (Collins 2002: 51)

(68) If X selects Y (where Y is a lexical category), then *X Z Y where Z intervenes between X and Y, and Z is any lexical category (±V, ±N). (Collins 2002: 52)

These principles correctly derive that the constituent in (69a) is legitimate, while the constituents in (69b-c) are not. In (69a), the determiner selects for a noun and its sister is indeed the noun. In (69b), the determiner does not find the noun, because it is simply not present in its sister. Structure in (69c) is slightly more interesting: *city* is contained in the sister of the determiner, but it is not immediately dominated by the sister node, so that the verb *destroy* intervenes and correctly blocks this structure.

(69) a. { the, destruction }
b. *{ the, destroy }
c. *{ the, { destroy, { the, city } } }

The problem arises with constituents in (70a-b) that are incorrectly predicted to be

possible. In (70a), the adjective subcategorizes for a noun that is indeed immediately dominated by its sister. For (70b), Collins (2002) assumes that noun *cities* does not contain a null determiner and consequently it is local enough for checking of the selection feature on the determiner.

(70) a. *{ beautiful, { the, city } }
b. *{ the, { destroy, cities } }

Thus, the Minimality and Intervention conditions in (67)-(68) together ensure that the goal of selection is immediately dominated by the sister node rather than simply embedded in it. They cannot restrict which of the two syntactic objects immediately dominated by the sister must fulfill the selection requirement and this is accomplished for by the third principle given in (71).

(71) Accessibility condition:
A lexical item X (and the features it contains) is accessible without search to a syntactic operation if X contained the probe/selector for the last operation in the derivation. (Collins 2002: 55)

Collins (2002) claims that this principle is required independently of labeling, but it turns out to be crucial for distinguishing correct constituents from the illegitimate ones and allows to exclude both impossible structures in (70a-b). In particular, in (71a), the determiner discharges its selection feature when merged with the noun, so that the determiner (not the noun) must be targeted by the next Merge step. The Accessibility condition also excludes search into complex specifiers as, for instance, in (72) and ensures that it is the inflected verb that is visible to further selection here, not the equally deeply embedded determiner. In result, further distribution of a constituent is always determined by a syntactic object that has checked its selection feature upon the preceding Merge step.

(72) a. { that, { the, boys }, { see, { their, friend } } }
b. *{ know, { the, boys }, { see, { their, friend } } }

It seems however that significantly improving the empirical coverage of the model, the Accessibility condition also introduces backtracking and essentially reinvents labeling: A syntactic object that has checked its probe in the previous step of the derivation is recorded and temporarily acts as a label for the whole constituent. A possible objection that the model still differs from a proper labeling in that the memory of only one previous derivation step is required turns out to be invalid once actual derivations involving agreement are considered. In (72), for instance, the subject must receive case before the derivation can further proceed with the Merge of the C head. Given that case assignment involves satisfying the probe on the subject, the Accessibility condition as it stands entails that it is the subject that is accessible

without search, because its probe was checked as the last operation. The constituent thus must have a distribution of the DP, contrary to the facts. Complicating the definition and assuming that only some feature checking operations count for accessibility implies that the memory of the last checked subcategorization feature stays in the derivation for a number of subsequent steps and is thus identical to creating a temporary label. In result, the model simply reinvents labels.

Non-deterministic labeling

The next labeling algorithm is the non-deterministic labeling procedure proposed by Chomsky (2013, 2015) and intensively discussed since then; see Epstein et al. (2014, 2020), Boškovič (2016), Ginsburg (2016), Rizzi (2016), Hayashi (2020), Moro & Roberts (2020), Nakashima (2020), Blümel (2022), Ke (2022), McInnerney (2022) among others. Since one existing analysis of forced ex-situ effects relies on this labeling algorithm, I have already considered this approach earlier in the dissertation and have shown that it does not account for all known cases of forced ex-situ. Here I will once again summarize the central aspects of this proposal, but from a more general perspective rather than with a focus on the account of the forced ex-situ effects. In doing so, I will consider this algorithm as it was suggested by Chomsky (2013, 2015) abstracting away from various and mutually incompatible modifications proposed in the literature cited above.

The algorithm is summarized in (73). Labeling is assumed to apply under Minimal Search, output of which depends on the phrase-structural status of merged syntactic objects.

(73) Labeling algorithm:

- a. If syntactic object = {H, XP}, labeling algorithm will select H as the label.
- b. If syntactic object = {XP,YP}, Minimal Search is ambiguous, locating the heads X, Y of XP, YP, respectively. There are two ways in which syntactic object can be labeled:
  - (i) Modify syntactic object so that there is only one visible head (i.e., one of the phrases moves out).
  - (ii) X and Y are identical in a relevant respect, providing the same label, which can be taken as the label of the syntactic object.
- c. If syntactic object = {H, H}, one of them is a root and the other provides the label.

Chomsky (2015) further complicates the model by introducing the notion of a weak head. Weak heads cannot label unless they are strengthened, for instance, by agreement.

I would like to point out four, in my view pressing, problems of this labeling algorithm (see also the discussion by Adger (2012)).

First, Chomsky (2013, 2015) states that labeling takes place at the phase level, as part of the Transfer operation. This means that labels are practically absent from syntactic computation and at the stage where Merge applies none of the merged syntactic objects have a label. Together with the fact that Merge is free (not feature-driven) under this approach, this leaves no mechanisms to preclude building of illegitimate syntactic structures. Distinguishing correct syntactic structures from illegitimate ones then relies solely on the output conditions that still remain to be formulated.

Second, the approach undergenerates: It allows {XP, YP} constituents to persist until the end of the derivation only if the heads of the two phrases agree with each other. As suggested by Hayashi (2020), this makes wrong predictions for languages without agreement and for specifiers that regularly do not agree (for instance, for indirect objects or nominal arguments).

Third, in addition to technical problems noted in 5.3.5, labeling by a shared feature incorrectly predicts that the behavior of a constituent differs depending on the presence of the specifier and moreover on the features of the specifier. For instance, traditional TPs are here replaced by ⟨2PL,2PL⟩ or ⟨3SG,3SG⟩ depending on the ϕ-features on the subject. Nevertheless, TPs seem to behave uniformally for LF and PF processes independently of their specifiers' ϕ-features.

Fourth, the algorithm is intended as a conceptual simplification that allows to reduce labeling to Minimal Search, but factually lacks a unified labeling procedure. The algorithm falls into a number of individual cases and the choice of label in each of them is stated by a separate rule. Note also that even labeling in a simplest {H, XP} case does not follow from the atomic nature of heads, but faces a complication in head movement and requires further assumptions on what counts as a head (see Rizzi (2016)).

Exocentric labeling

The next proposal I will consider is the exocentric labeling algorithm developed by Adger (2012). It relies on the following assumptions: First, there is no distinctiveness condition on Merge, so that Self Merge is possble:

(74) Self Merge: Merge(X, Y), X = Y, → {X, X} = {X}. (Adger 2012: 19)

Second, there are no functional heads and the lexicon falls into CLex and RLex defined in (75).

(75) a. RLex = {$\sqrt{}$1, ..., $\sqrt{}$n}, the set of LIs (roots)
b. CLex = {l_1, ... , l_n}, the set of category labels (Adger 2012: 21)

Merge applies to roots in RLex and outputs of earlier Merge steps, while the labels are supplied from CLex. The choice of the label is determined by the set of Label

Transition Functions Λ as in (76) and the labeling algorithm in (77).

(76) Λ = CLex x CLex ={⟨N, D⟩, ⟨V, v*⟩, ⟨D, v*⟩ ... }

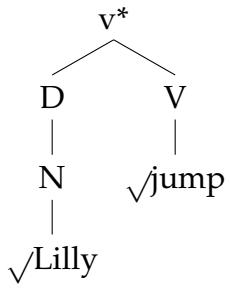
(77) a. Transition Labeling
If α, $\beta \in \gamma$, then Label(γ) = some L∈CLex, such that there are (possibly nondistinct) f and g ∈ Λ such that f(Label(α)) = g(Label(β)) = L.
b. Root Labeling
Label($\sqrt{}$x) = some L ∈ {N, V, A} (Adger 2012: 21)

The first part of the algorithm in (77a) states that the label for a constituent {α, β} is determined by Label Transition Function Λ and it is the label that can be supplied for both α and β independently. Given the simplistic Λ in (76), the sample derivation is presented in (78).

(78) a. Self Merge $\sqrt{}$jump = {$\sqrt{}$jump, $\sqrt{}$jump} = {$\sqrt{}$jump}
b. Label({$\sqrt{}$jump}) = V
c. Self Merge $\sqrt{}$Lilly = {$\sqrt{}$Lilly, $\sqrt{}$Lilly} = {$\sqrt{}$Lilly}
d. Label({$\sqrt{}$Lilly}) = N
e. Self Merge {$\sqrt{}$Lilly} = { {$\sqrt{}$Lilly}, {$\sqrt{}$Lilly} } = { {$\sqrt{}$Lilly} }
f. Label({ {$\sqrt{}$Lilly} }) = Cl because there are f and g ∈ Λ such that f(N) = g(N) = D (f and g nondistinct = ⟨N, D⟩)
g. Merge {$\sqrt{}$jump} and { {$\sqrt{}$Lilly} } = { {$\sqrt{}$jump}, { {$\sqrt{}$Lilly} } }
h. Label({ {$\sqrt{}$jump}, { {$\sqrt{}$Lilly} } }) = v* because there are f and g ∈ Λ such that f(N) = g(N) = v* (f = ⟨D, v*⟩ and g = ⟨V, v*⟩)

The resulting structure is given in (79).

(79) v*P structure



The resulting model radically differs from the one assumed in this dissertation in that Self Merge creates vacuous structure but labels introduce new information. Implications of this intricate proposal are in detail discussed by Adger (2012). All in all, however, this approach to labeling gives up the idea that labels are reduced to features on syntactic objects that build this constituent, a task that projection by selection, in my view, successfully fulfills.

Feature percolation

The final algorithm that I will consider here was suggested by Zeijlstra (2020). The conceptual premise of this approach is that since Merge of two syntactic objects creates a set, its label must be the unification of formal features from the two merged syntactic objects:

(80) Labeling by unification

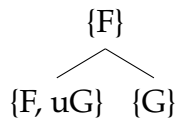
Developing this elegant idea, Zeijlstra (2020) considers and provides an account for various syntactic configurations. In what follows, I will talk about the main algorithm and show that it involves some unmotivated assumptions on which features percolate to the top node, so that the approach is ultimately not conceptually superior to projection by selection algorithm. Second, I consider in more detail cases where a syntactic object is selected before all of its merge features are discharged. These cases are explicitly allowed under this approach, but as I suggest they lead to unwanted empirical consequences due to percolation of all unchecked features. I also show that this analysis excludes projecting movement in favor of which I have argued in the previous chapter.

Zeijlstra (2020) assumes that Merge is feature-driven and suggests that a label is formed by all features of the merged syntactic objects except for those features that participate in a dependency resolved after this Merge step; see the rule in (81).

(81) Let A and B be two sets of formal features. If A merges with B, for any pair ⟨[F]–[uF]⟩ such that [F]∈A and [uF]∈B, or [F]∈B and [uF]∈A, neither [uF] nor [F] percolates; all other features do percolate. (Zeijlstra 2020: 39)

This rule states that a selection feature responsible for a given Merge step as well as a selected categorial feature do not project; see (82).

(82) Projection

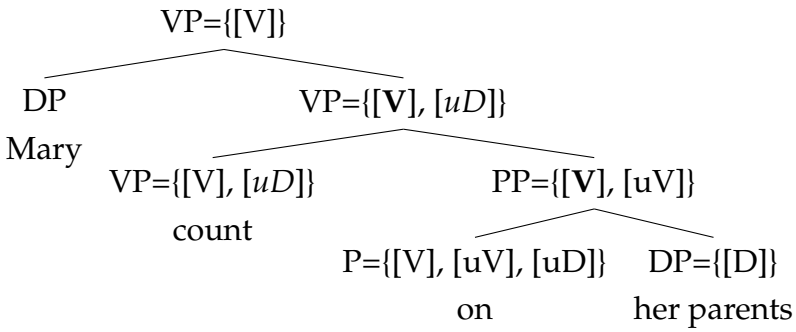


Zeijlstra (2020) points out that this approach to labeling is conceptually superior to projection by selection, because the latter needs to stipulate where the projected features come from. However, the algorithm in (81) also includes a rather unmotivated

assumption that the category of the selected syntactic object does not contribute to the label: While this categorial feature is targeted by selection, it is clearly not deleted after and remains accessible for further syntactic operations such as agreement or movement. Furthermore, in addition the categorial feature of the selected syntactic object, the algorithm needs to exclude projection of its other formal (but not active) syntactic features such as, for instance, ϕ-features. While I contend that the algorithm remains fairly simple, it still contains a number of stipulations exactly as projection by selection.

Let's explore how this model would derive projecting movement argued for earlier. Projecting movement required it to be possible for a syntactic object to be selected before its own selection features are checked. Zeijlstra (2020) explicitly includes such cases to derive PP arguments of verbs. He assumes that PPs always project a category of the selected syntactic object, V in this case.[39] Used as arguments, PPs can select verbs, but project the V features thereby not altering the category; see (83). Note that the verb here has an active Merge feature that percolates up and is then discharged in the next step.

(83) PP arguments (Zeijlstra 2020: 48)

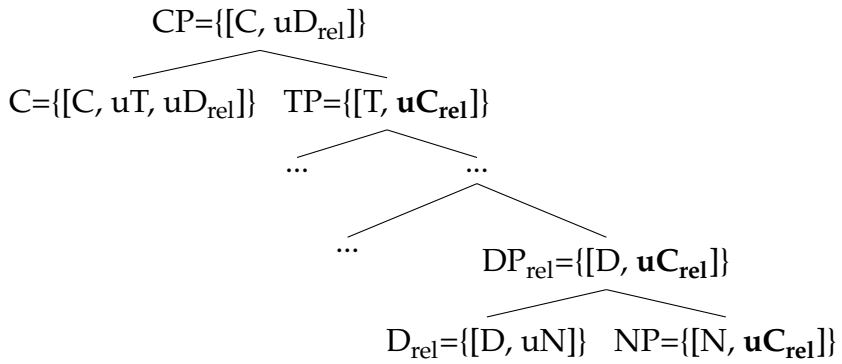


I would like to suggest that the possibility to discharge selection features after the syntactic object that projects a categorial feature has changed makes incorrect empirical predictions: It allow arguments of syntactic objects to be merged at any distance from their selector.

In addition, despite the possibility of delayed discharge of selection features, the approach does not account for projecting movement that I have argued is necessary in the derivation of raising relative clauses. Projecting movement is blocked here, because uC_{rel} feature on NP percolates up and is checked once the C head is merged to the structure. After this, there is no trigger for movement of the head noun and projection of its categorial feature in the landing site.

[39] Zeijlstra (2020) derives this by using the so-called supercategories that can get more specific categorial features from syntactic objects they merge with.

(84) No projecting movement



5.4.2 Arguments against projection by selection

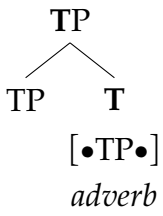
In this final section, I will consider existing arguments against projection by selection algorithm. In doing so, I will rely on the recent work by Zeijlstra (2020) (see also Adger (2012)) where unsolved and pressing problems of projection by selection are cataloged; see the list in (85) (the order is though different here). I will consider each of the points one by one.

(85) Problems of projection by selection (see Zeijlstra (2020)):

a. Adjunction
b. Free ordering
c. C-selection vs. s-selection
d. Mutual selection
e. Differences between (long-distance) Agree and local selection
f. Motivation

The first suggested problem deals with adjuncts: They differ from arguments in that their presence is optional. It also appears that adjuncts select what they can be merged with, but do not provide a label. For instance, the T head is fully content without any adjuncts, so that it seems to be the requirement of the T-level adjuncts that they must be merged with the T head. At the same time it is still the T head that provides a label. These facts are widely discussed and there are numerous proposals on how adjunction can be incorporated; see Frey & Gärtner (2002), Fowlie (2017), and Müller (2022) among others. Notably, Zeijlstra (2020) develops a solution under his alternative labeling algorithm, but it resolves the issue for projection by selection as well. Zeijlstra (2020) proposes that adjuncts indeed select and their category provides a label, but adjuncts must be themselves of the same category as a syntactic object they select for. As a result result, adjunction does not alter the label of the previous phrase even though the actual label comes from a different syntactic object; cf. (86).

(86) V with a direct object



One consequence of such approach is that instead of the familiar categories, the category of an adjunct should always match category of its host. This however also leads to further complications with adjuncts that can merge with syntactic objects of different categories as in (87).

(87) a. [$_{VP}$ [$_{VP}$ meet Mary] [$_{PP}$ in the park]]
b. [$_{NP}$ [$_{NP}$ man] [$_{PP}$ in the park]] (Zeijlstra 2020)

Zeijlstra (2020) suggests a way out by assuming that the category of a syntactic object projects can come about as the result of agreement with a syntactic object it just merged with. This allows a traditional PP to be a DP if they are merged with a DP and a VP if it is merged with a VP.

In this work, I however pursue a yet another approach that allows to accommodate adjunction under projection by selection algorithm: I assume that the presence of some features in features stacks is optional (cf. edge features that are freely available on phase heads according to Chomsky (2008)). This means that, for instance, verbs can come to the derivation with a feature stack that includes [•AdvP•] or [•PP•] or none of these features. The presence or absence of a feature in a given stack than leads to the presence or the absence of an adjunct. This arguably simple solution to the problem leads to a very general issue of the approach I am pursuing in this work: How ordered feature stacks come about?

There are again several ways to approach this question: One option is to assume that feature stacks are simply a part of the lexicon. Every syntactic category is then associated with a number of feature stacks that can enter the numeration together with it. The use of different feature stacks then leads to different effects in the derivation. Another option is that feature stacks are composed at the start of the derivation in accordance with certain principles that are yet to be explored (cf. Müller (2020)). This implies that order and thus essentially the structure in the derivation comes not only from Merge that applies to syntactic objects from the Numeration, but there are other means to create structure as well. This is not necessary a bad outcome (pace Adger (2010)). First, nothing in principle argues against this seemingly different structure building operation in fact being Merge as well with the only difference that applying in the different component of grammar it yields a somewhat different result. Second, syntactic theory in fact includes a number of operations besides

Merge. For instance, Agree is clearly not reducible to just Minimal Search, but also includes copying of a value or deactivation (also known as deletion) of the checked probe. Movement is also not just internal Merge, but it also includes creation of a copy of the displaced syntactic object. Furthermore, the concept of numeration itself presupposes that syntactic objects with their features are selected from the lexicon and placed in numeration. In general, the idea recently entertained by Chomsky (2015) that linguistic phenomena are reducible to the simplest computational operation Merge and third factor principles is conceptually attractive, but at least at the current stage it is far from accounting for the variety of linguistic phenomena and instead significantly reduces the empirical coverage of the model.

Returning to the criticisms of projection by selection, the second problem raised by Zeijlstra (2020) is that projection by selection itself does not give the order in which syntactic objects must be merged, which may allow merging the arguments in any order thereby freely exchanging specifiers with complements. This problem is resolved by assuming that merge features are ordered as discussed above.

The third problem is that at least in some cases the syntactic selection appears to be very broad; see, for instance, (88), where the verb in English can select for a DP, a CP, or a PP.

(88) a. [$_{VP}$ know [$_{DP}$ Mary]]
b. [$_{VP}$ know [$_{PP}$ about Mary]]
c. [$_{VP}$ know [$_{CP}$ that Mary has left]] (Zeijlstra 2020)

One solution entertained by Zeijlstra (2020) is that known syntactic categories can be more general than originally thought, so that DPs and CPs share a feature that can be then targeted by selection. Here I assume another approach: As I have already suggested for adjunction, syntactic objects are not associated with one unique feature stack, but can correspond to somewhat different feature stacks, so that some verbs can indeed have selection features for objects of different categories.

The fourth issue pointed out by Zeijlstra (2020) is mutual selection: When a preposition is merged with a DP, it is on the one hand a requirement of a preposition to select for a DP, but on the other hand the DP also needs case from the preposition, i.e., selects for it in some sense. While the dependency relations between merged syntactic objects can be indeed bi-directional, this is not problematic as typically one of the dependencies has to be formalized as categorial selection, while the one as Agree. Also, the case probe on the DP does not have to be valued by the case on P, but by any syntactic object that has a required case feature.

This leads us to the fifth problem: the difference in locality between checking of merge and agree features. Merge features must be checked very locally, under sisterhood, while discharge of agreement probes is also possible across some distance. One option is that merge and agreement features are ontologically different as essentially implied by the [•F•] and [⋆F⋆] notation. At the same time, bullets and asterisks might

be viewed as purely notational devices and the observed differences in locality follow from the type of the sought feature and defective intervention. Merge features search for category that all syntactic objects have. In result, if the closest syntactic object (i.e., the sister) cannot check the feature, its categorial feature intervenes and does not allow to probe further and find a goal. Merge features can be then reformulated as agree features selecting for the category; see, e.g., [∗cat:DP∗].

The final criticism of projection by selection is a conceptual one: There seems to be no deep reason why a syntactic object that selects is also the one that provides a label. Note though that the algorithm is in principle compatible with the idea that labeling applies under Minimal Search. Unlike in case of Agree, in case of labeling search always finds two syntactic objects and the choice between them is made on the basis of their properties: A syntactic object that checks its categorial selection feature as a result of this Merge step provides a label. The search for this specific property remains unmotivated, but as I have shown above all existing labeling algorithms require assumptions specific to the labeling procedure, so I conclude that as other syntactic operations, Merge and Agree, Labeling requires its own principles specific for human language.

5.5 Summary

In this chapter, I was investigating the consequences and further applications of the proposal in the previous chapter. I started by discussing late merge and have shown that it shares with the projecting movement an assumption that syntactic objects can be themselves selected before all their selection features are satisfied. I have suggested that delayed valuation of merge features in case of late merge can follow from ordering of the relevant selection feature after a probe that is checked only later. I have then turned to the second order merge features and demonstrated that forced ex-situ effects is a wide-spread phenomenon and that proposed analysis based on the second order selection features can be extended to other attested data. As both projecting movement and the account of forced ex-situ effects are enabled due to projection by selection labeling algorithm, in the end of this chapter I have talked about labeling procedure more generally, and discussed some of the existing alternatives and criticisms of projection by selection. I have concluded that combined with the assumption that features are organized in ordered stacks, projection by selection algorithm is superior to alternatives both in its empirical coverage as well as conceptually.

Chapter 6

Summary

Relative clauses with inverse case attraction in Moksha are at the empirical core of this dissertation. These relative clauses are peculiar in that the head of the relative clause shows case assigned to the relativized position inside the relative CP and the relative construction occupies a position on the left periphery.

The investigation of this phenomenon brought the following results.

First, relative clauses with ICA are externally-headed relative clauses derived by the raising derivation. Their left-peripheral position results from the movement of the relative CP, not base generation on the left.

Second, the raising derivation is part of natural language syntax and it co-exists with the head-external structure.

Third, the raising derivation includes projecting movement of the head noun phrase that follows from projection by selection approach to labeling plus the possibility of upward search.

Fourth, obligatory left-peripheral position of the relative clause instantiates a type of derivation where some constituent is formed at an intermediate stage, but must be destroyed before the derivation terminates. I call such patterns forced ex-situ effects and show that they are widely attested cross-linguistically.

Fifth, the forced ex-situ effects are best derived if syntactic selection applies not just for category but for other active features of selected syntactic object.

Overall, this work explores the model of syntax where where Merge is feature-driven, features on syntactic objects are organized in ordered stacks, and labels of newly formed constitutes are determined under the projection by selection algorithm. It shows that this model can account for non-trivial syntactic phenomena.

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