Topics in the Grammar of Koryak

by

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Abstract

This thesis consists of four chapters on the grammar of Koryak, a highly-endangered Chukotko-Kamchatkan language of the Russian Far East. In the first chapter, I argue that the distribution of the segments *v* and *w* in morpheme-final position needs to be handled by a phonological process that applies to bare morphemes. In the second chapter, I argue for a similar conclusion regarding the language's vowel harmony system. Both of these chapters therefore argue for a phonological architecture that includes the morpheme as a domain of to which phonology can apply, as in early generative phonology (Halle 1959; Chomsky and Halle 1968), but unlike in Lexical Phonology (Kiparsky 1982), standard Optimality Theory (Prince and Smolensky 1993), Stratal Optimality Theory (Bermúdez-Otero 2008), among others. The third and fourth chapters are independent, and concern the syntactic underpinnings of case-marking in Koryak. In the third paper, I argue that moving *wh*-words cause other nouns in the sentence to change their case-marking in a way that is consistent with a configurational account of ergative and certain instances of dative case (Yip et al. 1987; Marantz 1991; Baker 2015). In the fourth paper, I that inverse case attraction, a phenomenon where the head of a relative clause is marked with the case of the gap inside the relative clause, is the result of an internally-headed relative clause with a left-peripheral head, a type of relative clause that has otherwise only been proposed for the Gur languages of West Africa (Hiraiwa 2005 et seq.) Based on the available data on inverse case attraction in other languages, I further argue that the internal head analysis of inverse case attraction is a general solution to the phenomenon crosslinguistically.

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Тыкуйив'ӈыӈнэв' "Қайлём!" ымыӈ в'аняватылг'о чав'чывачг'энаӈ, микыйык омакаӈ тывэтатык, таиссследованьӈыма Камчаткак: Ав'тыкэ (А. Е. Уркачан), Г'оячек (П. А. Чече), Ёкав' (Е. И. Дедык), Каля (Л. Я. Авилова), Каляг'аӈ (Г. Ю. Уркачан), Камак (А. В. Камак), Қэчгыӈ (Г. Н. Харюткина), Қояӈ (О. К. Алексеева), Лыг'атыӈа (Л. А. Аслапова), Нёбаӈа (Л. П. Киселёва), Нутэӈэв'ыт (Н. С. Кузнецова), Пав'ла (П. П. Миронова), Пильгу (С. Н. Моисеева), Татаӈэ (Е. И. Сотрудинова),

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Contents

Chapter 1

Introduction

This dissertation is composed of four largely independent chapters, all having to do with the grammar of Koryak, a Chukotko-Kamchatkan language of northeastern Russia. The first two are about Koryak phonology, and argue that two phenomena, the distribution of morpheme-final labial continuants and the vowel harmony system, require significant restrictions on possible underlying representations to be analyzed correctly. The latter two treat two phenomena related to morphological case in Koryak, one concerning the relationship between case assignment and *wh*-movement, and the other concerning the distribution of cases on the head of a relative clause.

In the first chapter, I examine the distribution of the segments *v* and *w* in Koryak, whose relationship is one of contextual neutralization: they contrast prevocalically, but only *w* is found on the surface in preconsonantal or word-final position. As a result of these, we find alternations between the two segments: an underlying /v/ is realized as *w* when it happens not to occur prevocalically, but is realized as *v* when it is followed by a vowel, as schematized in (1). As expected, there are also instances of underlying /w/ that occur as *w* preconsonantally and do not get realized as *v* before a vowel, as schematized in (2).

(1) *waŋaw* 'word' vs. *waŋav-at-ə-k* 'to speak'

(2) *ko-wt-at-ə-ŋ* 'it is blossoming (of a tree)' vs. *wət-at-e* 'it blossomed (of a tree)'

Notably, there are no instances of these in morpheme-final position: every instance of *w* is in underlying morpheme-final position alternates with *v*. At first glance, this appears to implicate a morpheme structure constraint banning /w/ from morpheme final position. However, morpheme structure constraints have long attracted controversy in generative phonology (Kenstowicz and Kisseberth 1977 et seq.), with various frameworks, such as Lexical Phonology (Kiparsky 1982) and more famously Optimality Theory (Prince and Smolensky 1993), attempting to remove them from the grammar. Various approaches in Optimality Theory and its descendants have therefore tried to account for phenomena like this one using surface phonology or by positing derivational levels above the level

of the morpheme but below the level of the word. In this chapter, I survey a variety of such approaches including Input-Output Comparative Markedness, Output-Output Comparative Markedness (McCarthy 2003), Paradigm Occultation (McCarthy 2005), Stratal OT (Bermúdez-Otero 2008), and Optimal Interleaving (Wolf 2008). All of these, I show, make incorrect predictions, largely because they attempt to account for the morpheme-final restriction without directly invoking it. I conclude that the correct way to account for this is by allowing phonological computation to apply directly at the level of morphemes, so as to prevent them from occurring with an underlying final /w/. While I implement this using evaluation by ranked constraints, this analysis can also be implemented in many ways, including in a Halle (1959)-style morpheme structure rule, one of the earliest proposals for morpheme-level phonology.

The second chapter argues for a considerably more robust set of restrictions on underlying representations based on the dominant-recessive vowel harmony system of Koryak. In this language, morphemes belong to one of three classes, each of which is defined by the vocalism it allows and imposes on other morphemes in the word. Consider the examples in (3). In the first case, both the root and the suffix are recessive, and the word has the vowels *i u e*. In the second case, a mixed suffix is added onto the word. Since mixed morphemes are more dominant than recessive ones, and mixed morphemes allow the vocalism *i u a*, this cause lowering the root's *e* to *a*, but leaves the other vowels unaffected. In the third case, the suffix is dominant, which enforces the vocalism *e o a* on the word it occurs in. Consequently, all of the vowels of the root are lowered by one step. Note that the harmonic behavior of a morpheme is independent of the vowels that it has, as dative suffix in (3c) is composed only of a single consonant, and nonetheless triggers the vowels of the rest of the word to change.

(3) a. *ujetikite*
ujetiki$_R$-te$_R$
sled-INST
'by means of a sled'

b. *ujatikpiʎ*
ujetik$_R$-piʎ$_M$
sled.DIM
'a little sled'

c. *ojatekeŋ*
ujetiki$_R$-ŋ$_D$
sled-DAT
'to a sled'

I propose an analysis of this phenomenon whereby morphemes like the datives suffix are taken to represent the core part of the system: the harmony behavior of a morpheme

does not come from the vowels it has, but is instead reflected by the vowels that it has (if any). As a result of this, the trigger of vowel harmony is taken to be a set of floating vocalic features associated with each morpheme. I propose an analysis whereby the vowels of a morpheme are obligatorily underspecified for the features involved in harmony, and that when the relevant features are not provided by the context, the recessive set emerges as a result of the emergence of the unmarked. This is in order to prevent vowel harmony from being triggered by the vowels of a morpheme, which I show invariably leads to incorrect predictions. Since the requirement that morphemes have their vowels underspecified and come with a limited set of floating features cannot be accounted for without morpheme-level phonology, I propose an OT grammar that derives the restricted underlying representations, the output of which feeds into the surface phonological grammar I propose.

The third chapter concerns the relationship between dependent case and *wh*-movement. Here, I argue that arguing that moving absolutive noun phrases in Koryak trigger dependent case competition at the intermediate landing sites of successive-cyclic movement. This is exemplified in (4-5): when the embedded object *wh*-word moves into the matrix left-periphery (4a), the matrix subject is required to be ergative, whereas it is absolutive in the corresponding answer. Likewise, when the absolutive object of the complement of an object control verb is questioned, the matrix object bears dative case (5a), whereas it bears absolutive case when the object is not questioned (5b).

(4) a. jej-u$_i$ {ɣə-nan / *ɣə$\widetilde{\text{tɕtɕ}}$i} ∅-valom-na-w, əno
what-ABS.PL {2SG-ERG / *2SG.ABS} 2/3.S/A.IND-hear-3.O-3PL that
ʔewŋəto-na-k ∅-j-ə-$\widetilde{\text{tɕ}}$im-aw-nin t_i
Hewngyto-OBL.SG-ERG 2/3.S/A.IND-CAUS-EP-break-VBLZ-3SG.A > 3.O
'What all did you hear that Hewngyto broke?'

b. ɣəmmo t-ə-valom-ə-k, əno ʔewŋəto-na-k
1SG.ABS 1SG.S/A-EP-hear-EP-1SG.S that Hewngyto-OBL.SG-ERG
∅-j-ə-$\widetilde{\text{tɕ}}$im-aw-nin kojŋ-o
2/3.S/A.IND-CAUS-EP-break-VBLZ-3SG.A > 3.O cup-ABS.PL
'I heard that Hewngyto broke cups.'

(5) a. jeq-utt-u$_i$ ə-nan
what-tree-ABS.PL 3SG-ERG
∅-ku-n-mit-ə-tv-aw-ŋ-ə-nin
2/3.S/A.IND-PRS-CAUS-skilled-EP-INCH.VBLZ-VBLZ-PRS-EP-3SG.A > 3.O
{qaj-ə-kmeŋ-ə-ŋ / ??qaj-ə-kmiŋ-u} j-ə-ɲŋ-ev-ə-k t_i
{DIM-EP-child-EP-DAT / DIM-EP-child-ABS.PL} CAUS-EP-grow-VBLZ-EP-INF
'Which trees is he teaching the children to plant?'

b. ɣəm-nan t-ə-ku-n-mit-ə-tv-aw-ŋ-ə-na-w
1SG-ERG 1SG.S/A-EP-PRS-CAUS-skilled-EP-INCH.VBLZ-VBLZ-PRS-EP-3.O-3PL

{qaj-ə-kmiŋ-u / *qaj-ə-kmeŋ-ə-ŋ} j-ə-ɲŋ-ev-ə-k
{DIM-EP-child-ABS.PL / DIM-EP-child-EP-DAT} CAUS-EP-grow-VBLZ-EP-INF
utt-u
tree-ABS.PL
'I am teaching the children to plant trees.'

On my analysis, this is because ergative and dative in Koryak are dependent cases (Marantz 1991; Baker 2015), and the language allows dependent case be triggered at each step of successive-cyclic movement between the *wh*-word's base position and landing site. This accounts for the fact that this interaction is unique to absolutive *wh*-words, and is only triggered when a *wh*-word moves across another nominal. This data therefore provide strong support for the dependent case analysis of ergative in Koryak, which, I argue, is supported by a variety of movement-independent facts of the language.

The fourth chapter proposes a novel analysis of inverse case attraction (ICA), a phenomenon whereby the head of a relative clause can be marked with the case that it would be assigned as an argument of the embedded verb, as exemplified by the ergative-marked relative clause head in (6).

(6) {ŋavət͡ɕŋ-ə-n / ŋavət͡ɕŋ-a} mik-ə-ne-k na-kətʔajŋa-ɣe *pro*$_{2sg}$
{woman-EP-ABS / woman-ERG} who-EP-OBL.SG-ERG INV-scold-2SG.O 2SG.ABS
∅-ku-junet-ə-ŋ-∅ woteŋ-ŋa-k
2/3.S/A.IND-PRS-live-EP-PRS-3.S.IND this-house-LOC
'The woman who scolded you lives in this house.'

I argue against both previous analyses of this phenomenon. The first has treated ICA as involving an externally-headed relative clause with the stipulation that languages with ICA allow a process of case transmission between the relative pronoun and the head (Harbert 1982; Gračanin-Yuksek 2013 a.o.) I argue against this proposal on both empirical and theoretical grounds, showing that true externally-headed relative clauses pattern differently from ICA clauses on a variety of constituency tests, and that an empirically adequate analysis not stipulating a process of case attraction is preferable to one that does stipulate it. The second analysis that has been proposed for ICA proposes that it involves correlatives clauses (Bianchi 1999, 2000a). I show that Koryak relative clauses with ICA are substantially different both syntactically and semantically from correlatives, arguing that the former are nominal, unlike correlatives, which are clausal. Instead, I propose that these relative clauses are internally headed with their heads pronounced in relative clause's left periphery, as has been proposed for the Gur languages of West Africa (Hiraiwa 2005 et seq.) This accounts for the fact that they show a mix of the properties of externally headed relative clauses and correlatives, as well as the fact that they bear embedded case marking. Crucially, the analysis accounts for the latter without resorting to an otherwise unmotivated process of case attraction.

Given the diversity of the topics discussed in this dissertation, each chapter of this dissertation can be read individually. However, since the two phonology chapters (chapters 2 and 3) argue for the same point, and some of the discussion of phonological theory is split across them, they can profitably read together. The fourth and fifth chapter both broadly concern the syntactic underpinnings of case assignment in Koryak, and some conclusions from the fourth briefly make an appearance in the fifth. Beyond that there is no necessary connection between them, such that they can be read as separate papers.

Chapter 2

Koryak Labials

2.1 Introduction

One of the central principles of Optimality Theory (Prince and Smolensky 1993) and its descendants is the Richness of the Base (ROTB), which holds that the input to the grammar does not have language-specific properties. Otherwise put, anything that is a possible underlying representation in one language is a possible underlying representation in any language. In standard OT, this means that rules and constraints applying at the morpheme level (Halle 1959, 1964; Stanley 1967; Chomsky and Halle 1968, et. seq.) cannot be invoked: any generalizations over morphemes must fall out from surface constraint interaction. The reason for this is parallel evaluation: the grammar is taken to evaluate an entire word (or phrase) all at once, and the existence of levels to which rules apply cyclically, as in Lexical Phonology (Kiparsky 1982), is not countenanced. Since the input to a grammar that evaluates candidates in a single step must be the underlying representations, it follows that standard OT does not allow restrictions on underlying representations.

One implication of this is that it is not possible to account for linguistic generalizations about specific languages by claiming that the underlying forms of a language systematically have or lack a particular property. For example, we might wonder why English has no words with clicks: none of **⊙æd*, **!ɔg*, and **ǂɛk* are acceptable, though *bæd*, *dɔg*, and *t͡ʃɛk* all are. Assuming a ban on morpheme structure constraints, one way we *cannot* account for this is by saying that the underlying representations of English systematically lack clicks, despite the fact that this is almost certainly true: no learning principles for underlying representations I know of (Lexicon Optimization (Prince and Smolensky 1993), Free-Ride Principle (McCarthy 2005), Minimum Description Length (Rasin et al. 2018) etc.) would generate underlying representations with clicks when faced with clickless English data. Instead, we have to posit that there is a part of the phonological grammar that prevents clicks from surfacing. In Optimality Theory, for instance, this is ensured because the constraint ***Vel Ingr**, which penalizes forms that contain clicks, ranked above **ID-Airstream**

Mech, which penalizes forms that contain segments that surface with a different airstream mechanism than their correspondent in the underlying representation. As schematized in the tableau in (7), this means that it is preferable to change a click into a pulmonic stop than to realize it faithfully, ensuring that no clicks will surface in English.

(7)

⊙a		*Vel Ingr	ID-Airstream Mech
a.	⊙a	∗!	
b. ☞	pa		∗
pa			
a.	⊙a	∗!	∗
b. ☞	pa		

If there are no morpheme structure constraints, it follows that there can be no phonological generalizations that can only be stated over underlying representations: all aspects of natural language phonology must be derivable by constraints that operate over structures above the morpheme level.[1] Consequently, the combination of ROTB and parallel evaluation would be empirically falsified if a language were found with a phenomenon that could be shown not to be analyzable by any phonological processes that apply above the morpheme level. Otherwise put, a phonological generalization that can only be captured by positing a morpheme-level phonological process would show that the original OT conception of ROTB was untenable. In this chapter, I present the first of two case studies of such phenomena in the phonological grammar of Koryak, a Chukotko-Kamchatkan language of the Kamchatka Peninsula (Russia). This one concerns the distribution of the segments *v* and *w*, a distribution that can only be captured by positing a morpheme-level phonological process like a morpheme structure constraint. The MSC (or the equivalent) is one that bans /w/ from appearing in underlying morpheme-final position, despite the fact that it can appear there on the surface. The fact that Koryak is highly synthetic, and that this restriction can be observed in large numbers of both roots and affixes, shows that a variety of reanalyses of this phenomenon that work for other similar problems will not work here. Based on this, I will conclude that the correct grammatical architecture is one in which phonological generalizations can be stated directly over underlying forms.

[1] In standard parallel OT, these constraints operate at the word level, whereas in stratal OT they apply at every stratum.

2.2 Background on Koryak *v*, *w*

Koryak is a Chukotko-Kamchatkan language spoken in the northern Kamchatka Krai and eastern Magadan Oblast in the Russian Far East. It is endangered[2] and highly understudied, lacking a full descriptive grammar: previous work on the language includes a few dictionaries, the most comprehensive of which is Zhukova (1967), as well as a sketch grammar (Moll 1960), partial descriptions of two of the dialects (Zhukova 1972, 1980), and a monograph-length historical corpus study of negation (Mal'ceva 2014). The data in this dissertation are primarily from my fieldwork, which was carried out on the Chawchuven (reindeer-herding) dialect during the summers of 2018 and 2019, as well electronically since 2014. I have supplemented this data with sentences from Koryak literary texts and monolingual textbooks where appropriate.

Koryak contrasts *w* and *v* prevocalically, as shown by the word-initial examples in (8), the intervocalic ones in (9), and the post-consonantal ones in (10). Aside from *p*, these are the only oral labial consonants of the native lexicon.[3]

(8) a. *wutku* 'here' vs *vutqəvut* 'darkness'
 b. *waɲavatək* 'to speak' vs. *vatqəlʔen* 'last'

(9) a. *ewejulʔetke* 'not scared' vs. *ŋeveq* 'if'
 b. *təkuwiɲɲetɣi* 'I am helping you' vs. *uvik* 'body'

(10) a. *mətwapaqɣele* 'we two searched for fly agaric' vs. *mətətvamək* 'we two were'
 b. *ŋet͡ɕaqwajamək* 'in the Ngechaq river' vs. *jaqvajat* 'which nation'

However, this contrast is neutralized to *w* in preconsonantal or final position[4], giving the alternations shown in (11) and (12). As we expect in contextual neutralization, there are instances of *w* that do not alternate whether they occur preconsonantally or prevocalically, examples of which are given in (13).

(11) a. *waɲav-at-ə-k* 'to speak' vs. *waɲaw* 'word'
 b. *jewjev-u* 'partridges' vs. *jewjew* 'partridge'

(12) a. *t-ə-ko-pkav-ə-ŋ* 'I am unable' vs. *pəkaw-ɣəjŋ-ə-n* 'inability'

[2] As many speakers either are nomads or live in very remote villages, the number of speakers is unknown, but is perhaps around 500 (Alexander King, p.c.) For the same reason, the current state of preservation of the language is unknown, though it is probably moribund: almost all speakers I have worked with are at least 65 years old of 2021, and I am not aware of any fluent native speakers younger than 50 years old.

[3] Unassimilated loanwords from Russian, a language all living Koryak speakers speak, also include [f] and [b], though in assimilated loanwords these are usually realized as [p] and [v], respectively (cf. Koryak *telepon* 'telephone' from Russian *telefon*, Koryak *qʎevan* 'bread' from Russian *xleb*.)

[4] The correct generalization should probably made in terms of syllables, as certain morphosyntactic environments result in C_1VC_2V syllabifying as $C_1VC_2.V$, in which case C_2 may be *w* but not *v*. Since nothing crucially depends on this, I will state the generalization in segmental terms for simplicity.

b. *in-i̲v̲-i* ‘you told me’ vs. *t-ə-ʔ-i̲w̲-təkʷ* ‘I would tell you two’

(13) a. *wə̲t̲-at-e* ‘it blossomed (of a tree)’ vs. *ko-w̲t̲-at-ə-ŋ* ‘it is blossoming (of a tree)’

b. *wiwət* ‘whalebone’ vs. *wiwt-u* ‘a lot of whalebone’

Only *w* exists as a geminate, which is optionally (usually in faster or less careful speech) realized as *kw*.

(14) a. *qewwaŋ* ∼ *qekwaŋ* ‘very badly’

b. *wunewwi* ∼ *wunekwi* ‘pinecones’

Based on this evidence, it is clear that the relationship between *v* and *w* is one of contextual neutralization: a contrast exists prevocalically, but is lost (in favor of *w*) elsewhere. The grammar for contextual neutralization in OT uses the schema M_{cont} » F » M: a specific markedness constraint penalizing the segment that does not appear in the environment in question outranks a faithfulness constraint to the feature that distinguishes the segments in question, which itself outranks a constraint (or constraints) penalizing the segments. Consequently, we expect to find the segments contrasting in all environments except the one where specific markedness applies, where the contrast is neutralized in favor of the less marked of the two. The tableaux in (18) show how this ranking schema correctly predicts the *w*∼*v* alternation, assuming the underlying representation of the alternating segment is /v/. The specific markedness constraint here is the licensing constraint in (15), which licenses *v* only in prevocalic position. Note that using this licensing constraint is equivalent to having the constraints *vC and *v#. The faithfulness constraint is ID-Son, given in (16), which militates against input-output correspondents with differing values for sonorancy. The general markedness constraint is *v, as defined in (17).

(15) **Lic-v / _ V**: Assign a violation to each candidate for each instance of *v* that does not occur immediately preceding a vowel

(16) **ID-Son**: Assign a violation to each candidate for each output segment whose sonorancy is different from its input correspondent’s.

(17) ***v**: Assign a violation to each candidate for each output *v*

(18) a.

av-a	Lic-v / _V	ID-Son	*v
a. ☞ ava			∗
b. awa		∗!	

b.

av#	Lic-v / _V	ID-Son	*v
a. av#	∗!		∗
b. ☞ aw#		∗	

c.

avC	Lic-v / _V	ID-Son	*v
a. avC	∗!		∗
b. ☞ awC		∗	

If we assume that geminates are represented as two distinct segments, the above ranking is all we need to derive the lack of *vv*, as shown in (19a).[5] Otherwise, we need an additional constraint *vː, as shown in (19b).

(19) a.

avva	Lic-v / _V	ID-Son
a. avva	∗!	
b. ☞ awva		∗

b.

avːa	*vː	Lic-v/ _V	Integrity	ID-Son
a. avːa	∗!			
b. ☞ awːa				∗
c. awva			∗!	∗

The tableaux in (18) only consider underlying /v/. As the tableaux in (20a) and (20b) show, the constraint ranking predicts that an underlying final /w/ should always surface as such. This underlying /w/ then corresponds to the non-alternating *w* in surface forms exemplified in (13). Given the existence of a non-alternating *w* in various positions, we would expect there to be paradigms where the final segment of a morpheme was a non-alternating *w*, that is, regardless of whether the first segment of the following morpheme is a consonant or a vowel (which is relevant to determining the realization of underlying /v/), the segment in question is *w*. This prediction is schematized in the tableau in (20c), the input to which is identical to the one in (20b) but for the morpheme boundary. Given that none of the constraints reference morpheme boundaries, the optimal candidate in (20c) is unsurprisingly identical to the one in (20b). We therefore expect there to be paradigms

[5]Incidentally, there don't seem to be morpheme-internal instance of *wv*; all examples I have found of this occur at morpheme boundaries, such as *wąna<u>w-v</u>alom-kaʎe-t͡ɕet-ɣəjŋ-ə-n* 'dictation' (lit. 'word-hear-writing') (Zhukova 1967, 103). This fact may turn out to also have to be accounted for using an MSC.

with no final consonant alternation involving *w*, such as the hypothetical paradigm in (21a), a minimal pair of (21b).

(20) a.

aw	Lic-v / _V	*vv	ID-Son	*v
a. ☞ aw				
b. av	*!		*	*
c. ap			*!	

b.

awa	Lic-v / _V	*vv	ID-Son	*v
a. ☞ awa				
b. ava			*!	*
c. apa			*!	

c.

aw-a	Lic-v / _V	*vv	ID-Son	*v
a. ☞ aw-a				
b. av-a			*!	*
c. ap-a			*!	

(21) a. **jewjew* vs. **jewjew-u*

b. *jewjew* 'partridge' vs. *jewjev-u* 'partridges'

Notably, no such morphemes exist: whenever a morpheme-final segment surfaces as a singleton *w* when not followed by a vowel, that segment surfaces as *v* when followed by a vowel. This observation is the empirical core of this chapter, the rest of which will be devoted to trying (and failing) to account for it without morpheme-level phonology. Now, there are two facts that qualify this statement, though neither is in conflict with it. First, as mentioned, this only applies to singleton *w*, as non-alternating geminate *w* is found in morpheme-final position, as in (22). Now, Koryak has processes that both insert and delete schwas, which will be described in more detail in §2.4.1. What is crucial is that the language does not allow hiatus in most environments, which it resolves by deleting the first vowel, or triconsonantal clusters in any environments[6], which is resolves by epenthesizing a schwa, preferentially at a morpheme boundary. Because of this, we can't actually tell whether the schwa that appears before a consonant-initial suffix (as in *wəww(-)ə-n*) is part of the root or not. In particular, if the root is cluster-final, we predict that a schwa will epenthesize before the absolutive suffix. If it is schwa-final, we predict that the absolutive

[6]Koryak phonology treats geminates as two consonants when it comes to phonotactics and stress assignment.

suffix will simply concatenate with the root. Consequently, the expected surface from is *wəwwən* either way.

(22) *wəww(-)ə-n* 'stone' vs. *wəww-o* 'stones'

Second, there are certain morphemes, some of whose forms suggest that they end in a non-alternating *w*, such as the root in (23). However, other forms of the same root (23b) show that the root actually ends in a schwa, which, like all vowels, is deleted before a vowel-initial suffix. Since schwas are only epenthesized word-internally when three consonants come in a row, this schwa cannot have been epenthesized, and so must come from the root. Compare (23b) with *wanjaw*, where we see that no schwa is epenthesized before the suffix *t͡ɕij/t͡ɕej*.

(23) a. *wiw-et-ə-k* 'to shake' (intr.) vs. *j-ə-wiw-ev-ə-k* 'to shake' (tr.)

b. *wiwə-t͡ɕij-ə-k* 'to shake a lot' (intr.), **wiw-t͡ɕij-ə-k*

c. *waŋav-at-ə-k* 'to speak', *waŋaw-t͡ɕej-ə-k* 'to argue'

What we see, then, is that while the relationship between *w* and *v* is one of contextual neutralization, if we consider only the morpheme-final pattern, this appears to be a case of allophony: *v* is found before vowels, and *w* is found before consonants. I will show that a pattern like this, where reference to the structure of underlying representations is necessary to account for the kinds of alternations found in the language, requires morpheme-level phonology like a morpheme structure constraint. In particular, I will argue that the morpheme-final segments alternate in the same way that morpheme-initial and morpheme-internal segments do, such that we need to require the underlying representations of Koryak not to have a /w/ morpheme-finally.

In the next sections, I will evaluate a variety of ways to account for the asymmetry in question, starting with one employing a morpheme structure constraint banning /w/ from appearing morpheme-finally. Since such an analysis is incompatible with a monostratal framework with ROTB like OT, I will then consider a variety of other means of accounting for this distribution in parallel OT, starting with taking it to involve a phonologically-derived environment effect and a morphologically-derived environment effect. I will then consider two other phonological architectures, Optimal Interleaving and Stratal OT, both of which are better suited to accounting for generalizations about morpheme-peripheral positions, and show that neither of these provides a better solution. Based on this, I will conclude that an approach using MSCs is the best way to model this phenomenon.

2.3 Some Accounts with Morpheme Structure Constraints

The generalization made in the previous section is the following: while *w* and *v* contrast morpheme-initially and morpheme internally when prevocalic, when found morpheme-finally, only *v* appears prevocalically, and only *w* appears preconsonantally. As discussed in the previous section, we can model this by taking the alternating segment to be underlyingly /v/, and the non-alternating segment to be underlyingly /w/. However, this fails to account for the fact that we never find non-alternating *w* in morpheme-final position. One way to account for this would be to posit the morpheme structure constraint in (24a) or morpheme-level phonological rule in (24b).

(24) a. *w]

b. w→ v / _#

The first of these is a static constraint on the lexicon. In a model-theoretic approach to phonology (Graf 2010), it can stand on its own as a morpheme structure constraint and successfully account for the lack of morpheme-final /w/ in Koryak morphemes. If we prefer a system in which there is constraint interaction at all levels, we can also have the constraint in (24a) outrank a faithfulness constraint to (say) sonorancy at the morpheme level, but be outranked by it at the word level. This solution is compatible with an OT framework with at least two levels, one of which is the level of bare morphemes. Instead of using a constraint, the solution in (24b) employs a morpheme-level rule, which turns finals /w/ into /v/, while leaving all other instances of /w/ alone. This rule has exactly the same effect as the constraint interaction just discussed. This also accounts for the lack of morpheme-final /w/ in Koryak morphemes, and is compatible with early generative rule-based frameworks.[7] Regardless of how we choose to implement the restriction on the underlying representation, we can feed the output of this process into a word-level grammar that makes use of the OT constraints discussed in the previous subsection, or a rule-based grammar with a rule that lenites /v/ to *w* when preceding a non-vowel, and end up with the attested pattern.

However, in the sense that we are interested in, all of the formulations in (24) are functionally the same: they all prevent morphemes that end in *w* from existing by manipulating the underlying forms of the morphemes themselves. As discussed above, this is incompatible with an non-stratal implementation of the Richness of the Base, which holds that any

[7] Equivalent to this is the redundancy rule (a 'morpheme structure rule' in Halle (1959)'s terms) in (1), which serve to fill in, so to speak, the redundant phonological material in a morpheme. This particular rule states that any segment that is an oral labial continuant and occurs morpheme-finally is an obstruent, excluding /w/ from this position.

(1) [+lab, +cont,-nas]→ [-son] / _#

underlying representation (the input to the grammar) of one language is a licit underlying representation of every other language. Which of these formulations of the constraint on underlying representations we choose is a largely a framework-internal choice, which I don't think can be solved on the basis of the Koryak data. I will therefore consider them equivalent, as they are all equally incompatible with ROTB.

2.4 Accounts Compatible with Parallel OT

2.4.1 Phonologically-Derived Environment Effect

One initially plausible way to account for these facts without employing morpheme-level phonology is to posit a process that turns prevocalic *w* into *v*, but limit this process to phonologically-derived environments. As a result, morpheme-internal *w* will surface faithfully, but only *v* will show up prevocalically at morpheme boundaries. I will illustrate the problems with this analysis using comparative markedness constraints (McCarthy 2003), but the point here is general to all phonologically-derived environment analyses.

Comparative markedness is based on the idea that the phonology can treat marked structures that are present in the input differently than it treats marked structures that arise as a result of morpheme concatenation or phonological processes. Constraints that distinguish between the two types of marked structures are called either 'old' and 'new' markedness constraints. Old markedness constraints penalize candidates with marked structures that also exist in the input, whereas new markedness constraints penalize candidates whose marked structures do not. When old markedness constraints are ranked above faithfulness constraints, the result is a grammar that penalizes marked structures found within morphemes, but not ones that arise due to morpheme concatenation. A constraint ranking with new markedness over faithfulness does the opposite, penalizing marked structures that arise at morpheme boundaries, but not ones already present within morphemes. In this case, we need the input-output new markedness constraint in (25a) to dominate the old version of the same constraint (25b).

(25) a. $_{N}$**IO-*wV**: Assign a violation to each candidate for each structure $[+\text{lab}, +\text{vel}, +\text{son}]_a$[-cons]$_b$ where $a > b$ (a precedes b) and there is no c such that $a > c > b$ iff there is no structure $[+\text{lab}, +\text{vel}, +\text{son}]_\alpha$[-cons]$_\beta$ where α is in correspondence with a and β is in correspondence with b, $\alpha > \beta$, and there is no γ such that $\alpha > \gamma > \beta$ in the input.

b. $_{O}$**IO-*wV**: Assign a violation to each candidate for each structure $[+\text{lab}, +\text{vel}, +\text{son}]_a$[-cons]$_b$ where $a > b$ and there is no c such that $a > c > b$ iff there is a structure $[+\text{lab}, +\text{vel}, +\text{son}]_\alpha$[-cons]$_\beta$ where α is in correspondence with a and β is in correspondence with b, $\alpha > \beta$, and there is no γ

such that $\alpha > \gamma > \beta$ in the input.

As long as precedence relations exist only within morphemes, the result of this ranking will be that morpheme-internal *w* + vowel sequences will be preserved, but *w* + vowel across morpheme boundaries will not be. To see how this works, consider the tableau in (26a). As this shows, the marked string *wa* does not incur a violation of $_N$**IO-*wV** because it corresponds with the input string *wa*.

(26)

awa	$_N$IO-*wV	ID-Son	$_O$IO-*wV
a. ☞ awa			*
b. ava		*!	

If, however, the *w* and *a* come from different morphemes, as schematized in (27), the other candidate is selected. Given that strings in the input are defined in (25a) in terms of precedence relations between segments, and, by hypothesis, heteromorphemic segments are not in precedence relationships with respect to one another, the candidate in (27a) (the winner in (26) incurs a fatal violation of the new markedness constraint as there is no string *wa* in its input.

(27)

aw-a	$_N$IO-*wV	ID-Son	$_O$IO-*wV
a. awa	*!		
b. ☞ ava		*	

These constraints will not affect the realization of a prevocalic *v*, which is what we want: regardless of the location of a morpheme boundary, we should have *v* surfacing faithfully.

(28) a.

ava	$_N$IO-*wV	ID-Son	$_O$IO-*wV
a. awa	*!	*	
b. ☞ ava			

b.

av-a	$_N$IO-*wV	ID-Son	$_O$IO-*wV
a. awa	*!	*	
b. ☞ ava			

This system successfully accounts for the above data: the grammar predicts the asymmetry in the distribution of *v* and *w* regardless of whether the morpheme in question ends

in *v* or *w*, as in either case only *v* will appear prevocalically before a morpheme boundary. This allows us to maintain a system without morpheme structure constraints.

However, this approach predicts that all phonologically-derived environments should behave the same way: *w* should never appear in a prevocalic environment created to satisfy a different constraint. This is because the new markedness constraint (the operative one in the alternation) never explicitly makes reference to a morpheme boundary. What it instead makes reference to is any phonological environment that does not exist in the input, which includes, but is not limited to, phonological environments created by morpheme concatenation. Given that Koryak has a process of morpheme-internal schwa epenthesis, this analysis predicts that underlying *w* before a schwa epenthesized inside a morpheme should undergo fortition to *v*. This prediction is false.

To illustrate this, consider one example of morpheme internal epenthesis, which is found in nominal roots with final clusters. Most nominal roots that end in a cluster form their absolutive singular form either by reduplication (29a) or with the suffix *-n* (29b). However, a small number of them (nearly all of whose final clusters are [+labial][+coronal]) instead epenthesize into the cluster, as in (30).

(29) a. /kumŋ/ - *kumŋ-ə-kum* ‘a shout’

b. /ʔujemtewilʔ/ - *ʔujemtewilʔ-ə-n* ‘person’

(30) a. /lewt/ - *lewət* ‘head’ vs. *la<u>wt</u>-ə-paje-k* ‘to cut hair’

b. /miml/ - *mimәl* ‘water’ vs. *miml-ə-jəʔilɣ-ə-n* ‘May’ (lit. ‘water month’)

c. /qapl/ - *qapәl* ‘ball’ vs. *qapʎ-ujit͡ɕv-at-ə-k* ‘to play ball’[8]

As the forms in (30a) show, epenthesis into the final cluster does not result in an underlying *w* surfacing as *v*, despite the fact that this is a derived prevocalic environment. Further examples are shown in (31).

(31) a. /wiwt/ - *wiwət* ‘whalebone’ vs. *wiwt-u* ‘a lot of whalebone’ (**wivət*)

b. /awta/ - *awət* ‘scraper’ vs. *awta-w* ‘scrapers’ (**avət*)

c. /kiwl/ - *kiwəl* ‘coagulated blood’ vs. *kiwl-in* ‘of coagulated blood’ (**kivəl*)

To save the derived environment account, we could say that the underlying representations in (30a) and (31) in fact contain schwas (so they are /lewət/, /wiwət/, etc.), exempting them from the derived-environment fortition rule. Let’s assume for contradiction that this is the case. This requires us to account for the fact that the schwa is not present in forms like *lawtəpajek* ‘to cut hair’ or *lewtək* ‘in hair.’ This therefore requires us to posit a process of schwa deletion in order to get rid of the schwa in forms where it does

[8]The alternation between *l* and *ʎ* in the morpheme ‘ball’ is due to consonant harmony triggered by the morpheme *ujit͡ɕv* ‘play’.

not appear. The way to do this is to posit a constraint interaction only allowing schwas to surface when they are necessary to prevent illicit consonant clusters. Since Koryak requires all consonants to be adjacent to a vowel, the relevant constraints would be ***ə** and **Lic-C / V**. In addition, since epenthesis preferentially targets morpheme boundaries (Zhukova 1972; Kenstowicz 1976), we can use the faithfulness constraint **Morph-Contiguity**, which assigns violations for each (morpheme-internal) adjacency relationship in the input that does not exist in the output. This constraint will militate against intramorphemic epenthesis, causing the epenthetic schwas to be preferentially placed outside of morphemes.

(32) ***ə**: Assign a violation to each candidate for each instance of *ə*

(33) **Lic-C / V**: Assign a violation to each candidate for each consonant not adjacent to a vowel

(34) **Morph-Contiguity**: Assign a violation to each candidate for every instance of input segments a,b whose output correspondents are not adjacent

An account using these constraints correctly predicts the facts for the form *lewtək*, the locative case form of *lewət* 'head', which is derived from underlying /lewət-k/ by metathesis of *ə* and the *t*.

(35)

lewət-k		Lic-C / V	*ə	M-Cont	DEP
a.	lewətk	∗!	∗		
b. ☞	lewtək		∗	∗∗	∗
c.	lewətək		∗∗!		∗
d.	lewtk	∗!∗		∗∗	

But it predicts the wrong form for *lawtəpajek*. Since stringing together the purported inputs results in a perfectly phonotactically licit word (unlike with *lewtək*), making any changes to it would incur needless faithfulness violations. Since the fully-faithful candidate (a) harmonically bounds the attested form (b), the schwa deletion approach does not work.[9]

[9]See Kenstowicz (1976) for a similar conclusion about schwa-deletion vs. schwa-insertion based on different facts.

(36)

lawət-paje-k		Lic-C / V	*ə	M-Cont	DEP
a. 💣	lawətpajek		*		
b. ☹	lawtəpajek		*	*!*	*!
c.	lawətəpajek		**!	**	*
d.	lawtpajek	*!		**	

A second approach we could take would be to restrict the prevocalic fortition to occurring before non-schwa vowels. This would get rid of the problem coming from morphemes with internal epenthesis, as the only vowel ever epenthesized in Koryak is the schwa. Unfortunately, this is immediately inadequate, as the purported fortition process also occurs in front of schwas epenthesized at morpheme boundaries (37).

(37) a. *waŋaw* 'word' vs. *waŋav-ə-ŋqo* 'from a word'

b. *jewjew* 'partridge' vs. *jewjev-ə-kjit* 'about a partridge'

There are morphemes with final clusters that are epenthesized into that do alternate with *v*, as in (38a), showing that *w* and *v* contrast in underlyingly preconsonantal position. Note that this form is also problematic in a different way for the schwa deletion approach, as it has a schwa before a singleton consonant, which is a position where it need not appear for phonotactic reasons. The forms in (38b) are similarly problematic for the schwa-deletion approach, as the root-internal schwa from the absolutive singular form is present in the verb built off of the same root, even though no triconsonantal cluster would result from deleting it.

(38) a. /əlavt/ : *əlavət* 'catamaran', *əlawto* 'catamarans'[10]

b. /tatəl/: *tatəl* 'festival', *tatələk* 'to celebrate a festival'

As the only ways to save the phonologically-derived-environment analysis make incorrect predictions, such an analysis is not tenable.

2.4.2 Morphologically-Derived Environment Effect

Comparative markedness can also be used to treat this as a morphologically-derived environment effect. The new markedness constraints in such an analysis would not consider just any marked strings in the output not present in the input, but only marked

[10] *Pace* Moll (1960, 103), who reports the plural as *əlavtu*, which is phonotactically illicit. This is one of a fair number of instances where Moll reports a *w* and my speakers report a *v* (or vice-versa), so this might simply be a typesetting error. It is worth noting that Moll's description of the alternation between *v* and *w* suggests that she had not noticed the full extent of it, though it is also possible that she didn't have the theoretical tools to adequately categorize it, working in a descriptive framework that lacked underlying representations.

strings created by morpheme concatenation. This circumvents the main problem that the phonologically-derived environment account from the previous subsection faced, which is that it predicted the alternation between *v* and *w* to apply in all new environments in the output (including, incorrectly, 39a), not just the ones in morpheme-final position (39b).

(39) a. /lewt/: *lewət* 'head' (**levət*) vs. *lewt-u* 'heads'

b. /iʎkiv/: *iʎkiw* 'lark' vs. *iʎkiv-u* 'larks'

To implement this without making reference to morpheme boundaries in the output, we need to make reference to the morphologically simplest form of the paradigm, and mandate faithfulness of the other elements of the paradigm to it. The relevant constraints are shown in (40) and (41).

(40) $_N$**OO-*wV**: Assign a violation to each candidate for each structure [+lab, +vel, +son]$_a$[-cons]$_b$ in the output where $a > b$ (a precedes b) and there is no c such that $a > c > b$ iff there is no structure [+lab, +vel, +son]$_\alpha$[-cons]$_\beta$ in the base where α is in correspondence with a and β is in correspondence with b, $\alpha > \beta$, and there is no γ such that $\alpha > \gamma > \beta$.

(41) $_O$**OO-*wV**: Assign a violation to each candidate for each structure [+lab, +vel, +son]$_a$[-cons]$_b$ in the output where $a > b$ and there is no c such that $a > c > b$ iff there is a structure [+lab, +vel, +son]$_\alpha$[-cons]$_\beta$ in the base where α is in correspondence with a and β is in correspondence with b, $\alpha > \beta$, and there is no γ such that $\alpha > \gamma > \beta$.

The tableaux in (43-47) demonstrate how these constraints account for the contrast in (39).[11] One constraint not discussed before must be introduced: DEP-_#, which penalizes candidates with word-final epenthetic segments, which are nearly always banned in Koryak. In (43), the maximally faithful candidate *lewt* is eliminated due to the final cluster, the candidate in (d) is eliminated due to word-final epenthesis, and the attested form *lewət* harmonically bounds *levət*, which has all of the faithfulness violations of the former, but also incurs one for changing the *w* to a *v*. The plural form of this noun in (44) takes the singular form as its base, though this ends up being irrelevant as the attested candidate satisfies all of the relevant constraints. This includes the two comparative markedness constraints, as there are no *wV* sequences in either the input or the output.

maybe restate DEP-finally as an align constraint: Align M-cat R, pros-word R

(42) **DEP-_#**: Assign a violation to each candidate for each word-final segment that does not have a correspondent in the input.

[11] The constraints $_N$OO-*wV and $_O$OO-*wV are abbreviated below to $_N$OO and $_O$OO, respectively.

(43)

lewt	Lic-C / V	$_N$OO	DEP-_#	ID-Son	M-Cont	$_O$OO	DEP
a. lewt	∗!						
b. ☞ lewət					∗		∗
c. levət				∗!	∗		∗
d. lewtə			∗!				

(44)

lewt-u (B: lewət)	Lic-C / V	$_N$OO	ID-Son	M-Cont	$_O$OO	DEP
a. ☞ lewtu						
b. lewətu				∗	∗	∗

In the case of the morpheme final *v*, we need a constraint to enforce the *v/w* alternation. I will use the licensing constraint in (45), which penalizes *v* that does not occur prevocalically. This ranking predicts the correct form: despite the fact that the base of the paradigm ends in a *w*, both the highly-ranked $_N$OO-*wV and ID-Son prevent *iʎkiwu* from surfacing.

(45) **Lic-v / _V**

(46)

iʎkiv	Lic-C / V	$_N$OO	Lic-v / _ V	ID-Son	M-Cont	$_O$OO	DEP
a. iʎkiv			∗!				
b. ☞ iʎkiw				∗			

(47)

iʎkiv-u (B: iʎkiw)	Lic-C / V	$_N$OO	Lic-v / _ V	ID-Son	M-Cont	$_O$OO	DEP
a. ☞ iʎkivu							
b. iʎkiwu		∗!		∗			

In order to respect ROTB, we also need to account for morphemes that end in *w*. This set of constraints also correctly generates the *w* - *v* for such morphemes, as shown using the hypothetical root *iʎkiw* in (48). What is crucial here is that the highly-ranked $_N$OO-*wV prevents *iʎkiwu* from surfacing in (49), despite the fact that this form is more faithful to

both the input and the base: *iʌkiwu* has a *w*V sequence not found in the base, which is exactly the structure that $_{N}$OO-*wV militates against.

(48)

iʌkiw	Lic-C / V	$_{N}$OO	Lic-V / _ V	ID-Son	M-Cont	$_{O}$OO	DEP
a. ☞ iʌkiw							
b. iʌkiv			∗!	∗			

(49)

iʌkiw-u (B: iʌkiw)	Lic-C / V	$_{N}$OO	Lic-V / _ V	ID-Son	M-Cont	$_{O}$OO	DEP
a. iʌkiwu		∗!					
b. ☞ iʌkivu				∗			

So far, this line of analysis works. The problem with this approach is that its only means of preventing morpheme-final *w* comes from output-output correspondence with the base. This means that it cannot account for words in whose bases morpheme-final non-prevocalic *w* would be licensed. One illustrative case of this comes from nominal roots ending in clusters. These roots take a suffix *-n* in the absolutive singular, with a schwa is epenthesized before the suffix due to Lic-C / V. Consider a hypothetical morpheme ending in a Cw cluster like **panenatw* (a minimal pair with *panenatv-* 'story'). A schwa must be epenthesized for phonotactic reasons, but other than this, no change to the underlying form of the morpheme is licensed by any markedness constraints. Consequently, nothing permits the unfaithful mapping of the underlying morpheme-final *w* onto another segment. The underlying final *w* surfaces faithfully in the absolutive singular, contrary to the attested pattern.

(50)

panenatw-n	Lic-C / V	$_{N}$OO	Lic-V / _ V	ID-Son	M-Cont	$_{O}$OO	DEP
a. 💣 panenatwən							∗
b. ☹ panenatvən				∗!			∗

This is just one example of why treating this phenomenon as a morphologically derived environment effect is not satisfactory. In general, this approach won't account for the lack of morpheme-final *w* in morphemes that do not ever occur word-finally, a class that includes prefixes, many nominal roots, adjectival roots, and a variety of verbal affixes.

2.4.3 Paradigm Occultation

We've seen in the previous two subsections that accounting for the morpheme-final lack of /w/ cannot be done by treating it as a derived environment effect. One way within Parallel OT to treat this as something other than a derived environment effect uses paradigm occultation, which McCarthy (2005) proposes as a general solution to possible ROTB counterexamples. This approach employs the output-output faithfulness constraints discussed in the previous subsection, but relies on positing an additional alternation between *w* and ∅, which output-output faithfulness constraints spread across the paradigm. I will illustrate this using the case study from Cairene Arabic that McCarthy provides, and then show that the Koryak facts present significant difficulties to this approach.

Cairene Arabic contrasts short and long vowels. However, this contrast is positionally restricted, as word-final vowels are always short. However, when they are followed by suffixes, they are invariably long. Otherwise put, short vowels in unsuffixed roots never correspond to short vowels in their suffixed forms. Consequently, alternations like those in (51) are found, but ones like those in (52) are absent (McCarthy 2005, 1).

(51) a. *ʔabu* 'father' vs. *ʔabuːk* 'your father'

b. *kunti* 'you were' vs. *ma kuntiːʃ* 'you were not'

c. *ʔuːlu* 'tell!' vs. *ʔuluːli* 'tell me!'

(52) a. **tabu* vs. **tabuk*

b. **katuː* vs. **katuːk*

Like Koryak, then, Cairene Arabic appears to pose a problem for frameworks without morpheme structure constraints: while both long and short root-final vowels can appear on the surface, either all are underlyingly short and get lengthened in non-final position, or all are underlyingly long and get shortened in final position. Because both a process of shortening of long vowels and a process of syncope of short vowels independently exist in Arabic, McCarthy proposes that the vowels in question are underlyingly long, and get shortened in word-final position, where they cannot be stressed (only stressed vowels can be long). Any underlyingly short vowels, he argues, are deleted in this position, and output-output faithfulness prevents vowels deleted in the base of a paradigm from surfacing elsewhere. The proposal amounts in essence to a chain shift shift in final position: long vowels become short, and short vowels delete.

The ranking that derives this is MAX-Vː, OO-DEP > Final-C > MAX-V, combined with stress-related constraints that function to prohibit final long vowels.

(53) a. **MAX-Vː**: Assign a violation to each candidate for each input long vowel that does not have a correspondent in the output.

b. **OO-DEP**: Assign a violation to each candidate for each segment in the output that does not have a correspondent in the base.

c. **Final-C**: Assign a violation to each candidate whose final segment is not a consonant.

d. **MAX-V**: Assign a violation to each candidate for each input vowel that does not have a correspondent in the output.

As shown in the tableau in (54a), a root that ends in an underlying long vowel has that vowel shortened in word-final position, as having it surface faithfully would violate the highly-ranked *V:#, and deleting it would violate the equally highly-ranked MAX-V:. A root ending in a short vowel, however, can have its final vowel deleted, as MAX-V: does not apply to it. A root ending in a consonant will surface faithfully, as there is no high-ranked markedness constraint to satisfy. This approach then correctly accounts for the distribution of final vowels in unsuffixed forms.

(54) a.

abu:	MAX-V:	OO-DEP	*V:#	C#	MAX-V
a. abu:			*!	*	
b. ☞ abu				*	
c. ab	*!				

b.

abu	MAX-V:	OO-DEP	*V:#	C#	MAX-V
a. abu				*!	
b. ☞ ab					*

c.

ab	MAX-V:	OO-DEP	*V:#	C#	MAX-V	DEP
a. abu				*!		*
b. ☞ ab						

When comes to suffixed forms, if the underlying representation has a final long vowel, as in (55a), this will surface faithfully as *V:# no longer applies. What is crucial to account for suffixed forms with underlying final short vowels (55b) is the is the the ranking of OO-DEP over MAX-V. Since OO-DEP penalizes outputs with segments that belong to the base but are not realized in them, the final vowel of short-vowel-final roots will also not surface in the suffixed form. Unlike the suffix, the final vowel is the realization of a segment from a morpheme in the base, but unlike the other segments of the root, it is not realized in the base. Such roots will behave identically to consonant-final roots (55c). This solves the

problem: roots can be underlyingly consonant-final, short-vowel-final, and long-vowel-final, but the former two behave identically, and only the long-vowel final roots ever actually surface with a vowel.[12]

(55) a.

abuː-k (B: abu)	MAX-Vː	OO-DEP	*Vː#	C#	MAX-V	ID-len
a. ☞ abuːk						
b. abuk						∗!

b.

abu-k (B: ab)	MAX-Vː	OO-DEP	*Vː#	C#	MAX-V	ID-len
a. abuk		∗!				
b. ☞ abk					∗	

c.

ab-k (B: ab)	MAX-Vː	OO-DEP	*Vː#	C#	MAX-V	ID-len	DEP
a. abuk		∗!					∗
b. ☞ abk							

In order to adapt McCarthy's analysis to the Koryak facts, we need to propose a similar chain shift. In this case, we can model it as $v \rightarrow w \rightarrow \emptyset$ in word-final position.[13] Consequently, a word-final underlying *v* is realized as *w*, and a word-final underlying *w* deletes, thereby appearing to be vowel-final. The OO constraint prohibits *w* in a derived form if it is not in the base. Consider a hypothetical morpheme *-law*, from which we need to derive a licit form. In whatever form in the paradigm this morpheme is word-final, it will have its final consonant deleted, as schematized in (56a). Then, in other forms in the paradigm, the constraint OO-DEP-w will prevent it from resurfacing.

(56) a.

...-law	MAX-v	OO-DEP-w	*w#	*v#	MAX	ID-Son
a. ...law			∗!			
b. ☞ ...la					∗	

[12]McCarthy notes that an additional process of epenthesis is relevant to forms like this, as final clusters are not always permitted. Consequently, the winning candidates are presented here simply for illustration; they not actually the attested forms of Cairene Arabic, in which a vowel (though not the purported root-final short vowel) would be present due to a high-ranking phonotactic constraint.

[13]Note that the last element in the chain shift does not have to be ∅. Since underlying /w/ does not visibly alternate with anything, we could posit that /w/ becomes any segment in final position, and the grammar would be responsible for deleting that segment.

b.

...-law-...	MAX-v	OO-DEP-w	*w#	*v#	MAX	ID-Son
a. ...law...		*!				
b. ☞ ...la...					*	

However, this analysis is problematic for Koryak. First, unlike in Cairene Arabic, where both parts of the chain shift (long vowel shortening and short vowel syncope) are independently attested in the language, only one of the parts (*v*→*w*) is attested in Koryak: nowhere in the language does *w* alternate with ∅. This makes the application of paradigm occultation more stipulatory, but does not completely exclude it. Second, since this account relies on *w# to delete the *w*, it only excludes underlying *w* from roots and suffixes, and not from prefixes, which will never be word-final. The fact that no prefixes are *w*-final means that crucial evidence that would support this approach is lacking. Third, setting up the bases of paradigms is considerably more complicated in Koryak than in Cairene Arabic, as there is no sense in which the forms in which particular morphemes occur word-finally are any more basic than those in which they do not. For example, consider trying to derive the verbal plural marker *la* from the UR *law* discussed above.[14] In order for this analysis to work, we need to have a form where this morpheme occurs word-finally serve as the base. As it happens, the only such form with this morpheme word-finally is the first person plural aorist (57a), so it would have to be set up as the base of the whole verbal paradigm, in order, for example, for the imperative plural not to surface as **q-aŋaŋja-law-tək*. But this is untenable on any restrictive theory of output-output correspondence, as there is no principled reason to choose this form over any other: the first person plural aorist form of the verb is neither morphosyntactically nor segmentally contained in the imperative plural, nor is its form any more informative than the other forms of the paradigm in the sense discussed in Albright (2010).

(57) a. *mət-aŋaŋja-la* '1NSG-sing-PL'
b. *q-aŋaŋja-la-tək* '2.IMP-sing-PL-2NSG' (**q-aŋaŋja-law-tək*)

Fourth, this is made even more problematic by the fact that many morphemes never occur word-finally: nominal roots with a final cluster (as we saw in the discussion of morphologically derived environment effects), adjectival roots, and any prefixes. Consequently, there is no base that could be invoked in order to prevent the final *w* from surfacing. This is also not an issue in Arabic as the length alternation is only seen in morphemes that surface word-finally in some form. Combined, these issues make an analysis of the Koryak facts based on paradigm occultation impossible.

[14] Note that the claim is not that the plural suffix *-la* would *have* to be underlyingly /w/-final, just that any suffix that is vowel-final on the surface could be underlyingly /w/-final, and so we have to consider the predictions of this system for any of the vowel-final suffixes.

2.5 Approaches Incompatible with Parallel OT

The attempts to account for the ban on underlying morpheme-final /w/ discussed above share all share a grounding in parallel OT: they do not admit of derivational levels between the input and the candidate. Not all approaches to morpheme-level phonology share this assumption, however. In this section, I consider two such accounts to the phenomenon, one in Stratal OT (Bermúdez-Otero 2008), and one in Optimal Interleaving (Wolf 2008), a descendant of Optimality Theory with Candidate Chains (McCarthy 2007). I conclude that adopting an empirically adequate version of the former is equivalent to adopting morpheme structure constraints, and that the latter is empirically inadequate.

2.5.1 Stratal OT

Stratal OT (Bermúdez-Otero 2008) is a version of OT that is explicitly derivational. In this model, words are evaluated cyclically at various levels specified by the grammar. Those levels can each have different constraint rankings, allowing, for example, stem-level and word-level phonology to have different input-output mappings in a manner reminiscent of Lexical Phonology (Kiparsky 1982).[15] In order for a stratal account of the data discussed here to work while respecting ROTB, we need two strata, a stem-level one and a word-level one. At the stem level, we need to a have a highly-ranked constraint against final *w*. Assuming that, during the process of word formation, a word is evaluated by the stem ranking after each morpheme is added, and that the output of this evaluation is part of the input to the next evaluation, this will filter out the *w* from any roots and suffixes that end in it: as the tableaux in (58) show, whether a morpheme underlyingly ends in *w* or *v*, it will have become *v* in subsequent stages of evaluation. On the word level, this constraint will be outranked by the surface licensing constraint on *v*, preventing it from appearing in codas.

(58) a.

aw	*w#	ID-Son
a. aw	∗!	
b. ☞ av		∗

b.

av	*w#	ID-Son
a. aw	∗!	
b. ☞ av		

[15] Note that the argument made here does not apply only to stem-and-word stratal models, but to any ones that do not countenance the evaluation of individual morphemes.

On the word level, the constraint *w# will be outranked by the surface licensing constraint on *v*, preventing it from appearing in codas. This will turn the phonotactically-illicit *v* created by the stem-level constraint ranking into *w*, as schematized in (59).

(59)

av	Lic-v / _V	ID-Son	*w#
a. ☞ aw		*	*
b. av	*!		

One interesting prediction the stratal approach makes is that pre-root morphemes should allow final *w*, as the constraint ranking on the stem level only makes reference to word-final *w* being banned. If it were true that underlying final *w* were banned only in roots and suffixes, it would be a strong argument in favor of a stratal account of this alternation. However, just like suffixes, there are no prefixes ending in *w*. Now, it is possible to augment the stratal model such that it no longer makes this prediction. This involves modifying the architecture so that instead of evaluating a morphologically-complex word at every instance of affixation, we instead evaluate each morpheme independently, and only then concatenate them and evaluate the constraint ranking at each stratum. While this manages to account for all the data, it arrives at an identical conclusion to the MSC approach: special phonology needs to be able to apply to individual morphemes. Consequently, the stratal approach with morpheme-level evaluation and the MSC approach that I argue for are merely implementational variants of the same proposal.

2.5.2 Optimal Interleaving

A different explicitly serial framework is Optimal Interleaving (OI) (Wolf 2008), which is especially well-suited to analyzing phonological patterns that are closely intertwined with the structure of morphemes. OI conceives of phonological operations and morphological spellout as occurring in the same module: phonological repairs to a word can be made either before or after the entire word has been spelled out. This allows it to distinguish certain types of derived environments that the parallel approaches considered above were crucially unable to do. OI is based on Optimality Theory with Candidate Chains (OT-CC) (McCarthy 2007), and adopts from it the idea that the candidates evaluated by the set of ranked constraints are *chains*: ordered sets of strings, each minimally different from the preceding one, and each more harmonic than the preceding one. In this case, minimally different means that each link in the chain can have a segment changed from the previous link, a segment deleted from the previous one, a segment epenthesized compared to the previous one, or a morph inserted corresponding to a set of syntactic features in the previous one. It also adopts from OT-CC constraints on chains requiring certain modifications

to occur before others, which are called Precedence (Prec) constraints. These constraints come into play at a second step of evaluation after all possible chains have been generated.

Given that each step in the candidate chain must be harmonically improving with respect to the previous one, we need to decide on the ranking in order to determine which chains are licit and which are not. First, since epenthetic vowels are inserted only next to consonants that are otherwise not adjacent to a vowel, we need the subranking Lic-C//V » DEP, as schematized in (60).

(60) a.

VC-CV	Lic-C / V	DEP
a. ☞ VCCV		
b. VCəCV		∗!

b.

VC-CCV	Lic-C / V	DEP
a. VCCCV	∗!	
b. ☞ VCəCCV		∗

We also need Lic-v / _V, *wV » ID-Son in order to allow lenition of *v* preconsonantally and fortition of *w* prevocallically.

(61) a.

vC	Lic-v / _V	*wV	ID-Son
a. vC	∗!		
b. ☞ wC			∗

b.

wV	Lic-v / _V	*wV	ID-Son
a. wV		∗!	
b. ☞ vV			∗

Preventing the *wV » ID-Son ranking from causing fortition to overapply will be done with the precedence constraint P(RA, ID-S), which requires that violations of ID-Son be preceded by the realization of an affix in all of the candidate chains leading to a particular candidate. To save space I will refer to it simply as Prec in the tableaux.

(62) **P(R-A, ID-S)**: Assign a violation to a chain for each time that:
   a. ID-Son is violated without an earlier insertion of an affix
   b. ID-Son is violated before the insertion of an affix

Finally, since epenthesis does not occur to prevent violations of ID-Son, we require the subranking DEP » ID-Son.

(63)

vC	Lic-v / _V	DEP	ID-Son
a. vC	∗!		
b. vəC		∗!	
c. ☞ wC			∗

Let's consider the form *waŋav-ə-ŋqo* 'word-EP-ABL', whose absolutive singular is *waŋaw*, and try to derive it (or any licit surface form) from the underlying representation /waŋaw/ that ROTB requires be considered. The two additional constraints we will need for an OI analysis are Max-Affix, which militates against affixes that have not been spelled out, and Realize-Affix, which does the opposite, penalizing candidates for realizing affixes. Following the OI principle that the root is spelled out before anything else, the first element of the candidate chain will be *waŋaw*-AFF, as shown in (66).[16]

(64) **Max-Affix**: Assign a violation to each candidate for every unrealized affix.

(65) **Realize-Affix**: Assign a violation to each candidate for every unrealized affix in the input that is realized in the output

(66)

	P(R-A, ID-S)	Max-Aff	R-A	Lic-C/V	Lic-v / _V	*wV	DEP	ID-Son
a. waŋaw-AFF		∗				∗		

Now we need to find what the next steps in the candidate chain are. Recall that each step must be harmonically improving with respect to the previous one. The following tableaux will consider a possible subsequent link in the candidate chain and compare them to the previous link, which is given as candidate (a). One acceptable next link in the chain is a candidate where the affix is realized. This results in new markedness (Lic-C/V and *wV) and faithfulness (R-A) violations, but these are offset by the lack of a violation of the highly-ranked Max-Affix. Consequently <waŋaw-AFF, waŋaw-ŋqo> is a licit chain.

[16] Wolf (2008) considers the possibility that this assumption may need to be relaxed, but ultimately does not take a stand either way. This will not turn out to have an effect on the analysis of Koryak.

(67)

	P(R-A, ID-S)	Max-Aff	R-A	Lic-C/V	Lic-V / _ V	*wV	DEP	ID-Son
a. waɲaw-AFF		*!				*		
b. ☞ waɲaw-ŋqo			*	*		*		

It is not, however, licit to epenthesize a schwa at the morpheme boundary, as this maintains the violation of Max-Aff, and adds another violation of *wV.

(68)

	P(R-A, ID-S)	Max-Aff	R-A	Lic-C/V	Lic-V / _ V	*wV	DEP	ID-Son
a. ☞ waɲaw-AFF		*				*		
b. waɲaw-ə-AFF		*				**!	*	

Changing the sonorancy of the root-final segment or the root-initial segment is also not viable. In both instances, the (b) candidates trigger further violations of markedness and/or faithfulness without getting rid of the Max-Affix violation. The second link in the chain therefore must realize the affix.

(69)

	P(R-A, ID-S)	Max-Aff	R-A	Lic-C/V	Lic-V / _ V	*wV	DEP	ID-Son
a. ☞ waɲaw-AFF		*				*		
b. waɲav-AFF		*			*!	*		*

(70)

	P(R-A, ID-S)	Max-Aff	R-A	Lic-C/V	Lic-V / _ V	*wV	DEP	ID-Son
a. ☞ waɲaw-AFF		*				*		
b. vaɲaw-AFF		*				**!		*

Once the affix has been spelled out, however, epenthesis is a possible next step, making <waɲaw-AFF, waɲaw-ŋqo, waɲaw-ə-ŋqo> a licit chain. In this case, epenthesis is harmonically improving as it gets rid of the violation of Lic-C/V at the expense of violating the lower-ranked DEP.

(71)

	P(R-A, ID-S)	Max-Aff	R-A	Lic-C/V	Lic-V / _ V	*wV	DEP	ID-Son
a. waɲaw-ŋqo				*!		*		
b. ☞ waɲaw-ə-ŋqo						**	*	

Changing the sonorancy of the root-final segment is not acceptable without the previous step, as this results in gratuitous violations of both markedness (Lic-C/V) and faithfulness (ID-Son).

(72)

	P(R-A, ID-S)	Max-Aff	R-A	Lic-C/V	Lic-V / _ V	*wV	DEP	ID-Son
a. ☞ waɲaw-ŋqo				*		*		
b. waɲav-ŋqo				*	*!	*		*

Only after epenthesis has occurred can the root-final segment change its sonorancy, giving the chain <waɲaw-AFF, waɲaw-ŋqo, waɲaw-ə-ŋqo, waɲav-ə-ŋqo>.

(73)

	P(R-A, ID-S)	Max-Aff	R-A	Lic-C/V	Lic-V / _ V	*wV	DEP	ID-Son
a. waɲaw-ə-ŋqo						**!		
b. ☞ waɲav-ə-ŋqo						*		*

In (74) are given the candidate chains that can be used to spell out the ablative form of this noun. Note that, since at every step in the derivation, there was only one harmonically improving change that could be made, the candidates are in a set-subset relationship with each other.

(74) a. <waɲaw-AFF, waɲaw-ŋqo>

b. <waɲaw-AFF, waɲaw-ŋqo, waɲaw-ə-ŋqo>

c. <waɲaw-AFF, waɲaw-ŋqo, waɲaw-ə-ŋqo, waɲav-ə-ŋqo>

Our derivation is not finished: now the various candidate chains must be evaluated against each other by the Prec constraint. To do this, we need to generate the LUMSeq (localized unfaithful mapping sequence) for each derivation. This is the ordered list of unfaithful mappings a chain has undergone. Subsequently, we need to reduce these by Chain Merger to rLUMSeq (reduced localized unfaithful mapping sequence), the ordered

list of crucial unfaithful mappings a particular surface form requires. 'Crucial' here means that a particular surface form requires a particular ordering of unfaithful mappings in order to be generated: if two unfaithful mappings can apply in any order and still produce the surface form in question, these two unfaithful mappings will not be ordered in the rLUMSeq. The rLUMSeqs for the candidate chains in (74) are shown in (75).

(75) a. <RA>

b. <RA; DEP>

c. <RA; DEP; ID-Son>

We now have to pass <surface,rLUMSeq> tuples back to the grammar for the final evaluation. Here, the rLUMSeqs themselves will be evaluated by the Prec constraint(s), and the final link in the chain will be evaluated by the others. The sum of the harmony of the of the surface form and the rLUMSeq is the harmony of the tuple. Whichever tuple has the highest harmony is selected as the output. In this case, the candidate in (c), is the winner, as its surface form is the most harmonic, and its derivatiion does not run afoul of the precedence constraint. The OI grammar presented above therefore makes the right predictions for *waɲavəŋqo*.

(76)

	P(R-A, ID-S)	MAX-Aff	R-A	Lic-C//V	Lic-v / _ V	*wV	DEP	ID-Son
a. <waɲaw-ŋqo, <RA>				*!				
b. <waɲaw-ə-ŋqo, <"; DEP>						*!	*	
c. ☞ <", <RA; DEP; ID-Son>							*	*

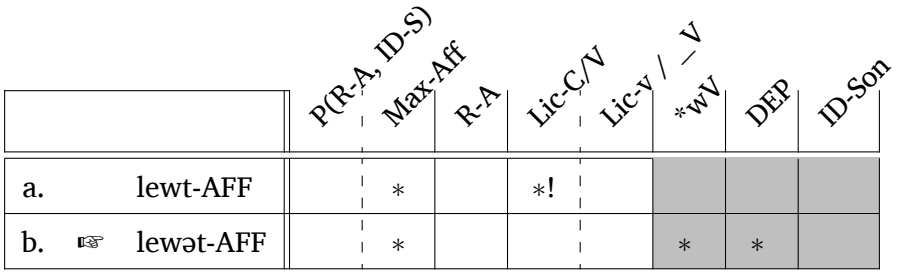
Let's now consider how to derive *lewət*. This is the absolutive singular form of the noun, so the affix will be null. As above, we first insert the root (77).

(77)

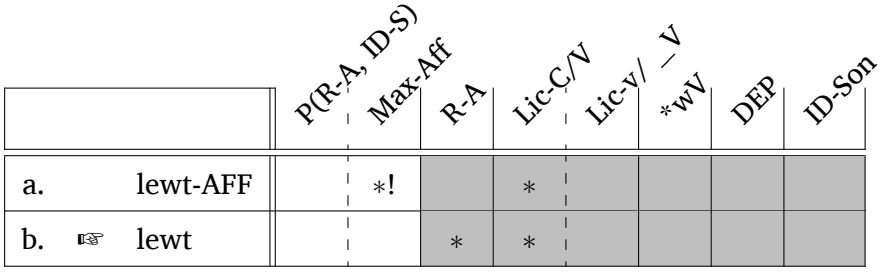
	P(R-A, ID-S)	Max-Aff	R-A	Lic-C/V	Lic-v / _ V	*wV	DEP	ID-Son
a. lewt-AFF		*		*				

We then have two options. We can epenthesize a schwa in the root-final cluster (78), or we can insert the null affix. Both of these are harmonically improving with respect to the first link in the chain. What we cannot do (yet) is have the /w/ undergo fortition and surface as *v*, as that violates both markedness and faithfulness constraints without realizing the affix. The affix having been realized, *lewt* is now a possible surface form.

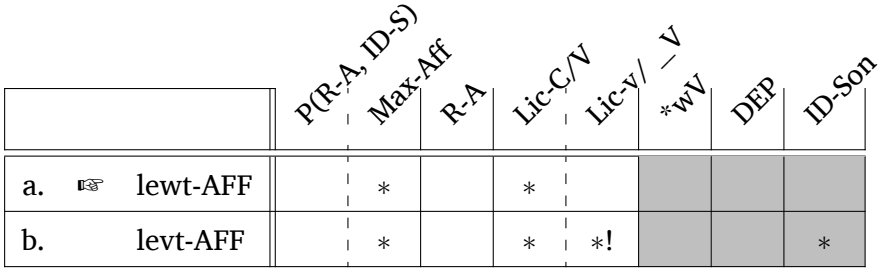
(78)



(79)

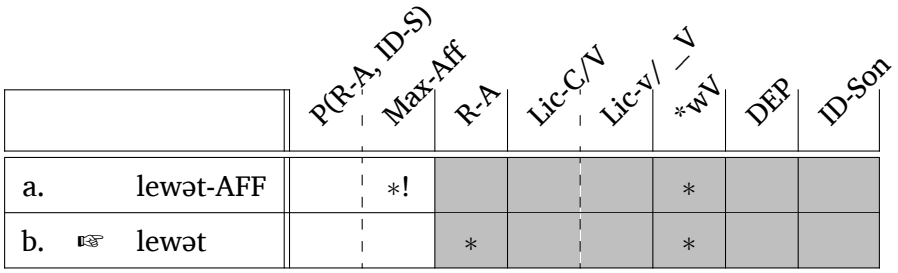


(80)

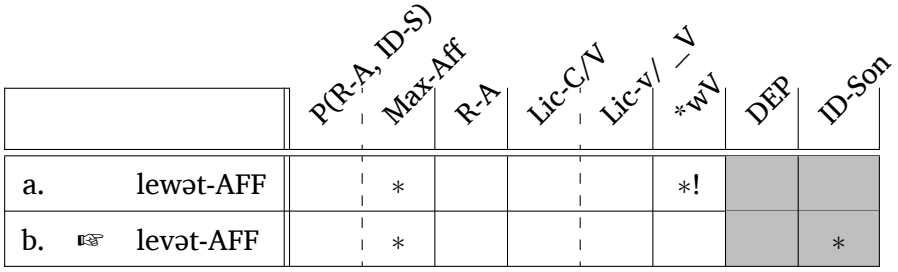


However, the chains whose second links are *lewət*-AFF are not completed. For them, we can then insert the null affix (81), which completes a chain, or have the *w* undergo fortition to *v* (82).

(81)



(82)



We can also extend the chain <lewt-AFF, lewt> by epenthesizing into the final cluster (83), and also by subsequently changing the *w* into a *v* (84), though we cannot do it in the opposite order, as changing the *w* into *v* without first epenthesizing is not harmonically improving (**??**).

(83)

	P(R-A, ID-S)	Max-Aff	R-A	Lic-C/V	Lic-V/ _ V	*wV	DEP	ID-Son
a. lewt				*!				
b. ☞ lewət						*	*	

(84)

	P(R-A, ID-S)	Max-Aff	R-A	Lic-C/V	Lic-V/ _ V	*wV	DEP	ID-Son
a. lewət						*!		
b. ☞ levət								*

(85)

	P(R-A, ID-S)	Max-Aff	R-A	Lic-C/V	Lic-V/ _ V	*wV	DEP	ID-Son
a. ☞ lewt				*				
b. levt				*	*!			*

Finally we can add a link after *levət*-AFF by realizing the null suffix, as shown in (86).

(86)

	P(R-A, ID-S)	Max-Aff	R-A	Lic-C/V	Lic-V/ _ V	*wV	DEP	ID-Son
a. levət-AFF		*!						
b. ☞ levət			*					

The candidate chains we have generated are given below, grouped by their surface form.

(87) a. <lewt-AFF, lewət-AFF, lewət>

b. <lewt-AFF, lewt, lewət>

(88) a. <lewt-AFF, lewət-AFF, levət-AFF, levət>

b. <lewt-AFF, lewət-AFF, lewət, levət>

c. <lewt-AFF, lewt, lewət, levət>

(89) a. <lewt-AFF, lewt>

The corresponding LUMSeqs are provided in below.

(90) a. <DEP, RA>

b. <RA, DEP>

(91) a. <DEP, ID-Son, RA>

b. <DEP, RA, ID-Son>

c. <RA, DEP, ID-Son>

(92) a. <RA>

Chain merger is used to collapse the candidates, maintaining only pairwise ordering relationships that are present in every derivation of a surface form (commas between violations indicate that there is no order between them).This gives us the rLUMSeqs in (93). The only crucial ordering is in (93b), where a violation of DEP (but not Realize Affix) is necessary for the /w/ of the underlying representation to undergo fortition to *v* (see the tableaux in (80) and (85).)

(93) a. <RA, DEP> (*lewət*)

b. < DEP; ID-Son> (*levət*)

c. <RA> (*lewt*)

We can now evaluate the tuples. Even though candidate (b) is more harmonic than candidate (a) for markedness and faithfulness constraints, the fact that its violation of ID-Son is not crucially preceded by insertion of an affix gives it a fatal violation of the precedence constraint. This prevents fortition from overapplying in this case, correctly accounting for the contrast that neither of the comparative markedness approaches were able to account for.

(94)

	P(R-A, ID-S)	MAX-Aff	R-A	Lic-C/_V	Lic-v/_V	*wV	DEP	ID-Son
a. ☞ <lewət, <RA, DEP> >						*	*	
b. <levət,< DEP; ID-Son> >	*!						*	*
c. <lewt, <RA> >				*!				

So far, then, the Optimal Interleaving analysis it promising: it is able to distinguish the morphologically-derived environment (where we get fortition) from the phonologically-derived environment (where we do not) because it makes explicit reference to whether or not a particular unfaithful mapping requires the insertion of an affix. If it does not, then this unfaithful mapping does not occur at a morpheme boundary, and is therefore not in the environment where *wV* is banned.

However, the problem with OI comes precisely from this. Given that *v*V is more harmonic than *w*V, if affixation crucially precedes a violation of **w*V, nothing should stop

that *w* from undergoing fortition to *v*, as this will not run afoul of P(R-A, ID-S).[17] Since affixation must necessarily precede any of the segmental violations of an affix, OI predicts that affixes should always undergo prevocalic fortition of *w*. The logic of this argument is shown in (95).

(95)

	P(R-A, ID-S)	R-A	Lic-C/_V	Lic-V/_V	*wV	DEP	ID-Son
a. <...wV$_{Af}$,<RA> >					*!		
b. ☞ <...vV$_{Af}$,<RA; ID-Son> >							*

The suffix *-lwən* 'disorderly group of' is therefore predicted to surface as *-lvən*, contrary to fact.

(96) a. /ʔətv/ 'boat': *ʔətv-ə-lwən* 'a disorderly group of boats'
b. /welv/ 'raven': *welv-ə-lwən* 'a disorderly group of ravens'

The non-stipulative move an OI theory can make to save itself is to take *-lwən* to be an exception to fortition by indexing the suppression the high ranking of the Prec constraint to it. However, this predicts that we should find morphemes that display prevocalic fortition in suffixed forms, *except* when one of those suffixes is *-lwən*. As far as I can tell, no such roots exist, and it would be quite remarkable to find one.

While OI fares better than comparative markedness, the fact that it reduces derived environments to the timing of spellout makes it incorrectly predict that all affixes behave as loci of derived environment effects.

2.5.3 Other approaches?

Could a different account of derived environment effects couched in a non-parallel framework capture the facts under discussion? I suspect the answer to this is 'no', at least not without employing something equivalent to an MSC, such as a bare morpheme stratum alluded to in the discussion of the Stratal OT approach to this phenomenon. The main reason for this is that the advantage that non-parallel versions of OT provide is the ability to order processes with respect to morpheme insertion and with respect to each other. But this doesn't really cut up the problem in the right way: as the attempt at an Optimal Interleaving analysis showed, it is not empirically adequate to hold that only a particular process feeds fortition. Consequently, focusing on the morpheme-final position in terms of its position, rather than in terms of it being part of a derived environment, seems to

[17] Thanks to Ezer Rasin for pointing out this prediction to me.

be the most fruitful. This is best done with an MSC. Now, we could both use an MSC to ban *w* from the morpheme-final position, and use the technology of our favorite theory to account for the derived environment. But this is unnecessary, as the MSC analysis presented in (2.3) fully accounts for the data without any particular machinery for derived environment effects. Consequently, it is preferable to explicitly employ morpheme-level phonology.

2.6 Proposal - Morpheme Structure Constraint

This is an unusual chapter in that the section on the proposal itself is by far the shortest. However, this is inevitable given that the analysis I am arguing in favor of is by far simpler than any of its (more modern) competitors. The previous sections have shown that a variety of more recent frameworks fail to correctly account for the distribution of *v* and *w* in the Koryak lexicon. Consequently, I propose that the phonological grammar of Koryak contains the MSC in (24a), which outranks ID-Son, as shown in (97). This prevents any morphemes from ending in /w/ underlyingly.

(97) *w] » ID-Son

Beyond this, all that is needed is a grammatical architecture that can derive contextual neutralization. This is fully compatible, for example, with a grammar of ranked violable constraints that evaluate candidates in one step, as in Parallel OT, where the contextual neutralization of *v* and *w* is carried out by the ranking Lic-v / _V » ID-Son.

2.7 Conclusion

In this chapter, I have argued that the distribution of *v* and *w* in Koryak requires something equivalent to the morpheme structure constraint *w] ranked above ID-Son in order to be accounted for, which is incompatible with a parallel grammatical architecture combined with a rich base. I have done this by showing that a wide variety of modifications to standard OT developed to account for similar issues without resorting to morpheme structure constraints will not work for Koryak. In the next chapter, we will find a similar argument coming from Koryak vowel harmony, though there the constraint interaction at the morpheme level will be rather more complex.

Chapter 3

Koryak Vowel Harmony

3.1 Introduction

This chapter concerns the vowel harmony system of Koryak, and argues that it too, like the distribution of *v* and *w*, needs to be accounted for using morpheme-level phonology. Koryak has 6 surface contrastive vowels, represented in a modified form of the IPA in (98).[1] Minimal pairs for all of them can be found (99), although the appearance of *ə* is almost always governed by the rules of epenthesis described in the previous chapter, as schematized in (100).

(98)

i *u*

e *ə* *o*

a

(99)
a. ***e*** vs. ***i***: *meməl* 'seal', *mimәl* 'water'
b. ***ə*** vs. ***u*** vs. ***i***: *qətək* 'to go', *qutək* 'to stand up', *qitək* 'to freeze'
c. ***o*** vs. ***u***: *jokkə* 'to place inside', *jukkə* 'to eat'
d. ***a*** vs. ***o***: *kojŋən* 'cup', *kajŋən* 'brown bear'
e. ***i*** vs. ***a***: *itɕ͡ʔən* 'clothing', *atɕ͡ʔən* '(solid) fat'
f. ***ə*** vs. ***e***: *ɣətɕ͡ɣən* 'feather', *ɣətɕ͡ɣen* 'of feather'
g. ***a*** vs. ***e***: *tajŋatək* 'to stock up on fish', *tejŋatək* 'to cry'
h. ***ə*** vs. ***u*** vs. ***o***: *jəɣək* 'to lasso', *jəɣuk* 'to bite', *jəɣok* 'to pluck'

[1] I exclude from consideration [ɪ], which for many speakers from northern Koryakia is the allophone of [i] in word-final closed syllables, e.g. [wiɲɲɛnnɪn] '(s)he helped him/her/them'. Additionally, I use the grapheme *e* to represent a segment that alternates somewhat predictably between [e] and [ɛ], with the former appearing rather more commonly in stressed open syllables, e.g. [epək] 'to put on', sometimes in unstressed open syllables, e.g. ['wiɲɲetək] ['wiɲɲɛtək] 'to help', and the latter more commonly in closed syllables [ɛwjik] 'to eat'. However, there is a significant amount of inter- and intra-speaker variation in the realization of this vowel, and no lexical or grammatical contrasts are due to this distinction.

i. ***e*** vs. ***u***: *epək* ‘to put on’, *upək* ‘to push off from’

j. ***u*** vs. ***a***: *ləʔuk* ‘to see’, *pəʔak* ‘to be dry/thirsty’

(100) a. *mimәl* ‘water.ABS’, *mimle* ‘water.ERG’

b. *pəʔak* ‘to be dry/thirsty’, *təkopʔaŋ* ‘I am thirsty’

These vowels participate in a system of bidirectional dominant-recessive vowel harmony that is highly typologically unusual in at least three ways. First, there is no single feature (frontness or ATR, for example) being harmonized for. Second, the surface forms of morphemes systematically underdetermine their harmony behavior, to the point that morphemes without vowels also participate in triggering vowel harmony. While opaque triggering of vowel harmony is known from languages like Hungarian (Vago 1976 et seq.), this behavior is limited to a small class of morphemes. In contrast, opaque triggering of vowel harmony is pervasive throughout the vowel harmony system of Koryak; perhaps even a majority of the morphemes of the language trigger vowel harmony in a way that cannot be predicted from their surface form. Finally, Koryak has three harmony classes, rather than the otherwise ubiquitous two.

For a preview of the system, consider the examples in (101), which are given in a nonstandard four-line glossing format that I will use only in this chapter: here, the first line contains the surface form of the word, the second line contains the form of the morpheme when it occurs in a word with only recessive morphemes, as well as a subscript indicating the morpheme’s harmony class (R for recessive, M for mixed, and D for dominant). The third line contains the gloss, and the fourth line an English translation.[2] We see in this example that the root *ujetiki-* ‘sled’ appears as *ujetiki* in the instrumental case, but that the *e* of the root lowers to *a* when the diminutive suffix *-piƛ* is added to it. When this is replaced with the dative suffix *-ŋ*, all of the vowels lower by one step: *u* to *o*, *e* to *a*, and *i* to *e*.

[2]The description of the harmony system here is based on fieldwork and work with texts carried out for my B.A. thesis (Abramovitz 2015), which much of the exposition in this chapter is based on. The description differs substantially from the description proposed in published works on Koryak such as Moll (1960) and Zhukova (1967, 1972, 1987), which largely or entirely ignored the class of mixed harmony morphemes. I later discovered that I. A. Murav’jova came up with an essentially identical description of the system in her 1979 dissertation (Murav’jova 1979). Unfortunately, as far as I can tell, nothing was ever published based on this, and it has remained ignored in the Koryak descriptive and pedagogical literature. The system that I describe is found in early Koryak texts (1940s and earlier), as well as in the speech of Northern Chauchu speakers without any formal language training, especially those from around the villages of Manily and Srednie Pakhachi. All Koryak speakers that I have worked with have a system of vowel harmony that is very similar to the one analyzed here, but many do not use it completely productively. Southern Chauchu speakers tend not to apply vowel harmony from a verb onto an incorporated noun or in compounds, though most northern speakers I have worked with do. Certain northern speakers (particularly those exposed to previous grammatical descriptions of Koryak) apply the mixed harmony somewhat inconsistently. This seems to be at least in part due to prescriptive influence, as the standard descriptions of Koryak do not recognize the existence of the mixed harmony morphemes, and therefore describe a vowel harmony system with only two classes (like the one in Koryak’s northern relative Chukchi). Unfortunately, some speakers have taken this to mean that mixed harmony morphemes are somehow ‘wrong’: educated speakers I have worked with sometimes think they are making a mistake (‘breaking the law of vowel harmony’, as they put it) when they apply the mixed harmony to a word. Uneducated speakers unproblematically produce the expected forms.

(101) a. *ujetikite*
ujetiki$_R$-te$_R$
sled-INST

'by means of a sled'

b. *ujatikpiʎ*
ujetiki$_R$-piʎ$_M$
sled.DIM

'a little sled'[3]:

c. *ojatekeŋ*
ujetiki$_R$-ŋ$_D$
sled-DAT

'to a sled'

3.2 Positional Control and Dominant-Recessive Vowel Harmony

In this subsection, I will provide a brief overview of the two major types of vowel harmony systems found in the languages of the world.[4] For our purposes, we can divide the vowel harmony systems of the world's languages into two classes: positional control, where a vowel in a certain position in a word (partially) determines the features of vowels elsewhere in the word, and dominant-recessive, where the presence of a particular feature (or features) anywhere in a word determines the features of vowels elsewhere in the word.[5]

In positional control systems, control of harmony comes from a certain position in the word, usually the left end of the word or the root. The vowels to the right of the root copy the root vowel in some feature: backness, roundedness, ATR, pharyngealization, etc.[6] A clear example of this comes from Kyrgyz, whose suffixes harmonize for both roundedness and backness of the root's vowels. Consider the following example, which shows the ablative suffix attaching to a variety of roots (Kaun 2004, 89):

[3]The syncopation of the root-final *i* in *ujatikpiʎ* seems to be due to an idiosyncratic property of this diminutive suffix.

[4]Given how different Koryak vowel harmony is from its counterparts in other languages, this discussion will treat these phenomena at a fairly coarse level of granularity, and will not include a survey of analytical approaches, which will be deferred to the analysis section of this chapter.

[5]For symmetry, we might be tempted to call this 'featural control'. I'll show in a bit why that term would be misleading for Koryak.

[6]A few cases of vowel harmony systematically controlled by suffixes and spreading onto roots have been argued for, most prominently in Turkana (Noske 2000) Fula/Fulfulde (Krämer 2003), though earlier works had proposed that systematically suffix-controlled vowel harmony did not exist (McCarthy and Prince 1995; Bakovic 2000). I am not aware of any cases of vowel harmony systematically controlled by prefixes.

(102)

a. iʃ-ten	work-ABL	et-ten	meat-ABL
b. ʒɪl-dan	year-ABL	alma-dan	apple-ABL
c. yj-døn	house-ABL	køl-døn	lake-ABL
d. tuz-don	salt-ABL	tokoj-don	forest-ABL

The ablative suffix has a vowel that alternates between four different surface forms: the first, used with *iʃ-* and *et-*, has a non-high front unrounded vowel, the second, used with *ʒɪl-* and *alma-*, has a non-high back unrounded vowel, the third, used with *yj-* and *køl-*, has a non-high front rounded vowel, and the fourth, used with *tuz-* and *tokoj-*, has a non-high back rounded vowel. Thus, only the height of the vowel of this suffix is invariant, while the backness and roundedness vary based on the vocalism in the stem: in (102a), the front unrounded vowel in the ablative suffix is due to the fact that the vowel in the roots are unrounded and front, in (102b), the back unrounded vowel in the suffix is due to the unrounded back vowels in the roots, and so on.

The other type of vowel harmony, which is considerably more typologically unusual, is dominant-recessive vowel harmony. In a language with dominant-recessive harmony, vowel alternations are not controlled by the morpheme in a particular position, but rather by the vowels' feature(s) themselves. Roughly speaking, in such a system, the presence of one subset of the vowels (the recessive vowels) in a word is incompatible with the presence of a different subset of the vowels (the dominant vowels.) When a word is put together such that it would contain vowels from both sets, the recessive vowels switch to their dominant counterparts. The most common feature used to distinguish the two sets of vowels is [ATR]; in particular, in nearly all dominant-recessive harmony systems, the [ATR] vowels are the dominant set, and the [RTR] vowels are the recessive set. The data in (103), from Diola-Fogny, a Bak (< Atlantic-Congo < Niger-Congo) language of Senegal, illustrates this type of vowel harmony pattern. Diola-Fogny has the following vowel inventory, split into [ATR]/[RTR] pairs [i/ɪ, e/ɛ, ə/a, o/ɔ, u/ʊ]. The forms on the left side of the following table have a root with [ATR] vowels, and the forms on the right have one with [RTR] ones (Ringen 1979, 256).

(103)

[ATR] root		[RTR] root	
a. jitum	lead	f. baj	have
b. jitum-en	lead-CS	g. baj-ɛn	have-CS
c. ni-jitum-en-u	1SG.A-lead-CS-2SG.O	h. nɪ-baj-ɛn-ʊ	1SG.A-have-CS-2SG.O
d. jitum-ul	lead-from	i. bəj-ul	have-from
e. ni-jitum-ul-u	1SG.A-lead-from-2SG.O	j. ni-bəj-ul-u	1SG.A-have-from-2SG.O

In (103a), the verbal roots are given without any additional morphology. In (103b), a causative morpheme is added, which is realized as *-en* when attached to the [ATR] root *jitum*, but *-ɛn* when attached to the [RTR] root *baj*. Further affixes are added in (103c),

where, as in (103b), the vowels of the suffixes match the vowels of the roots in tongue-root advancedness. Up to this point, the harmony system is consistent with a root-control analysis, as the vowel quality of the affixes in the examples is determined by the vowel quality of the root. However, (103d) and (103e) show this not to be the case. In (103d), the directional suffix is [ATR] for both verb stems and, additionally, both roots now have [ATR] vowels. This is further shown in (103e), where the 1st person agent suffix and 2nd person object suffix are in both cases [ATR], whereas they were [RTR] when attaching to *baj*. These examples show that there are two types of vowels in Diola-Fogny: one type whose tongue-root advancedness can alternate ('recessive' vowels, as they are called in the literature,) and one type whose tongue-root advancedness is fixed ('dominant' vowels). Further, if any of the vowels of the word are [ATR], then all of them must be.[7]

The difference between these systems then boils down to whether the controller of vowel harmony is the morpheme in a particular position in the word or is the morpheme with particular feature values. In the next section, we will see that Koryak vowel harmony belongs to the latter of these classes, though it has some complicating factors that make it rather different from most languages with this type of harmony.

3.3 Data

The first relevant difference that sets Koryak apart from perhaps all other languages with dominant-recessive harmony that I am aware of is that the language has three harmony classes, not the standard two. Recalling the six-vowel system of Koryak mentioned in (98), recessive morphemes in Koryak surface with any of the following bolded vowels if there are no non-recessive morphemes in the word.

(104)

i		***u***
e	***ə***	*o*
	a	

Recessive morphemes can be prefixes, roots, or suffixes, and can also be of any grammatical category, as illustrated in (105). When we combine recessive morphemes with other recessive morphemes to form words, there are no changes in their vowels, as shown in (106).

[7] Dominant-recessive vowel harmony almost always applies bidirectionally (Bakovic 2000), so the domain of harmony is usually just the word. But this is not always the case: Ribeiro (2002) shows that Karajá (<Macro-Jê; Brazil) has dominant-recessive ATR-harmony applying only right to left, and Koryak has dominant-recessive consonant harmony that also only applies from right to left.

(105) a. Nominal roots: *miʎute-*'hare', *utt-* 'tree', *ʔətv-* 'boat', *ujetiki-* 'sled', *ʔujemtewilʔ-* 'person'

b. Verbal roots: *t͡ɕet͡ɕkejuŋ-* 'think', *uʔet-* 'wait', *jle-* 'lead', *ekmit-* 'take', *-pl-* 'drink'

c. Adjectival roots: *-ilɣ-* 'white', *-mijku-* 'light', *-ketɣu-* 'strong', *-jənɣ-* 'cowardly'

d. Nominal affixes: *-(t)e* 'ERG', *-kjit* 'NARR', *-w* 'ABS.PL', *-t͡ɕəku* 'INESS', *-in(e)* 'POSS', *-k* 'LOC'

e. Verbal affixes: *ku- -ŋ* 'PRS', *ɣe- -lin* 'UW.P', *-tuje* 'RVS', *-tək* '2NSG', *-k* 'INF'

f. Adjectival affixes: *n- -qin(e)* 'ADJ', *mel-* 'M.COMP', *e- -k* 'NEG', *-ʔew* 'ADV'

g. Adverbs: *etun* 'maybe', *wutku* 'here', *et͡ɕɣi* 'now', *teʔi* 'how many', *qejŋun* 'of course'

(106) a. *ujetikik*
ujetiki$_R$-k$_R$
sled-LOC
'in a sled'

b. *utte*
utt$_R$-e$_R$
tree-ERG
'tree'

c. *ɣet͡ɕet͡ɕkejuŋlinet*
ɣe$_R$-t͡ɕet͡ɕkejuŋ$_R$-line$_R$-t$_R$
UW.PST-think-3.UW.PST-3DU
'they two thought'

Mixed morphemes can have any of the bolded vowels in (107). Note that, other than switching out *e* for *a*, these are the same vowels found in recessive morphemes. They also can be prefixes, roots, and suffixes, and (in principle) can be of any grammatical category, although there are far fewer mixed functional morphemes than dominant or recessive ones. I suspect, however, that this is simply a reflection of broader trends in the Koryak lexicon: mixed morphemes in general are rarer than dominant or recessive ones, and affixes are far fewer than roots, even in an extremely synthetic language like Koryak.

(107)

i ***u***

e ***ə*** *o*

a

(108) a. Nominal roots: *kali-* 'book', *kajŋ-* 'bear', *wji-* 'air', *kumŋ-* 'voice', *maqmi-* 'arrow'

b. Verbal roots: *kalit͡ɕit-* 'read', *kəlt-* 'tie', *kijtalat-* 'braid hair', *ajp-* 'cover', *ɣjiṗ-* 'train'

c. Adjectival roots: *-qiwwa-* ‘bad’, *-ikm-* ‘short’, *-əpuʎʎu-* ‘small’

d. Nominal affixes: *taŋ-* ‘unfortunate’, *-tajn* ‘near’[8]

e. Unpicky affixes[9]: *qaj-* ‘DIM’, *-piʎ(ʎaq)* ‘DIM’

f. Adverb: *amu* ‘maybe/probably’

g. Interjection: *ikaka* ‘hooray!’, *ənawut* ‘so’

When recessive and mixed morphemes combine in one word, the vowels of the mixed morpheme remain the same, and any *e* of the recessive morpheme lowers to *a*. The high vowels of the recessive morpheme, however, remain unaffected, even if they occur between a vowel and lowers and the triggering morpheme. Consequently, with the addition of mixed morphemes to the forms in (106), we find the forms in (109). This lowering of *e* is not only triggered by affixes onto roots: in the examples in (110), dominant roots trigger lowering of the *e* of both an inflectional prefixes and suffixes to *a*.

(109) a. *ujatikpiʎ*
ujetiki$_R$-piʎ$_M$
sled-DIM.ABS.SG
‘little sled’

b. *uttəpiʎ*
utt$_R$-ə-piʎ$_M$
tree-EP-DIM.ABS.SG
‘small tree’

c. *ɣaqajt͡ɕat͡ɕkajuŋlinat*
ɣe$_R$-qaj$_M$-t͡ɕet͡ɕkejuŋ$_R$-line$_R$-t$_R$
UW.PST-DIM-think-3.UW.PST-3DU
‘they two thought a bit’

(110) a. *maqmita*
maqmi$_M$-te$_R$
bow-INST
‘with a bow’

b. *nakuwjipŋənaw*
ne$_R$-ku$_R$-wjip$_M$-ŋ$_R$-ə-ne$_R$-w$_R$
INV-PRS-train-PRS-EP-3.O-3PL
‘they are training them’

[8]This suffix nowadays usually behaves as dominant, although the Koryak textbook Vdovin and Jajletkan (1949) contains various examples where it behaves as mixed. Modern editions of the stories of Ketsaj Kekketyn, which were originally written in the 1930s, contain some contradictory forms (some where it’s treated as mixed and some not), though these have been edited by modern speakers of Koryak, who may have changed the original text to conform with their dialect.

[9]These morphemes can attach to nominal, verbal, and adjectival roots.

Note that the diminutive suffix *-piʎ* triggers this lowering in (109) despite only surfacing with a high vowel.[10] This is an example of the second unusual property of Koryak vowel harmony discussed in the previous section: the surface forms of morphemes are systematically insufficient to determine their harmonic behavior. Indeed, the root *kəlt-* 'tie' triggers this harmony pattern, as shown in (111) despite its only vowel being a schwa, which occurs in all three harmony classes. Similarly, the near-minimal pair adjectival roots *iwl-* 'tall' and *ikm-* 'short' belong to the recessive and mixed classes, respectively. This fact is concealed in the singular forms (112), but becomes clear in the dual forms (113), where the number suffix protects the final vowel of the adjectival suffix *-qine* from syncope. Accordingly, the adjectival suffix is *-qine* in (113a), but *-qina* in (113b).

(111) *ɣakəltəlin*
ɣe$_R$-kəlt$_M$-ə-lin$_R$
UW.PST-tie-EP-3.UW.PST.SG
'(s)he tied it'

(112) a. *niwləqin*
n$_R$-iwl$_R$-ə-qin$_R$
ADJ-tall-EP-ADJ.SG
'tall'

b. *nikməqin*
n$_R$-ikm$_M$-ə-qin$_R$
ADJ-short-EP-ADJ.SG
'short'

(113) a. *niwləqinet*
n$_R$-iwl$_R$-ə-qine$_R$-t$_R$
ADJ-tall-EP-ADJ-3DU
'tall (du.)'

b. *nikməqinat*
n$_R$-ikm$_M$-ə-qine$_R$-t$_R$
ADJ-short-EP-ADJ-3DU
'short (du.)'

We saw above that the vowels of mixed morphemes do not change when they combine with recessive ones. Likewise, combining multiple mixed morphemes in one word does not affect their vowels: in (114), the *a*, *i*, and *ə* are unchanged by appearing in the same word as other mixed morphemes.

(114) a. *maqmita*
maqmi$_M$-te$_R$
bow-INST
'with a bow'

b. *maqmipiʎ*
maqmi$_M$-piʎ$_M$
bow-DIM.ABS.SG
'a small bow'

[10] It has an allomorph *-piʎʎaq* that surfaces when it does not occur word-finally, as in (1).

(1) *uttəpiʎʎaqu*
utt-ə-piʎʎaq-u
tree-EP-DIM-ABS.PL
'small trees'

c. *qajkəltək*
qaj$_M$-kəlt$_M$-ə-k$_R$
DIM-tie-EP-INF
'to tie a bit'

This fact should make it clear why I've been talking about recessive *morphemes*, rather than recessive *vowels* or *features*, as in the discussion of Diola-Fonyi in (103). In that language, whether or not the presence of a certain morpheme triggered vowel harmony is solely dependent on the featural specification of its vowels: if it has advanced tongue root vowels, then it triggers advanced tongue root throughout the word, and if not, it doesn't. Here, however, given that the vowel classes largely overlap (*i*, *u*, and *ə* all appear in both the recessive and the mixed classes), it is not possible to give a simple featural account of the distinction between the dominant and recessive vowels. As we will see now, even more instances of overlapping vowels across classes will come from the dominant morphemes.

Dominant morphemes can have any of the bolded vowels in (115), and, as we saw with the recessive and mixed morphemes, can be of any grammatical category, and can be prefixes, roots, or suffixes.

i *u*

e ***ə*** ***o***

(115) ***a***

(116) a. Nominal roots: *jaja-* 'house', *qoja-* 'reindeer', *qleva-* 'bread', *ʎaŋe-* 'girl', *jənn-* 'horn'

b. Verbal roots: *ommat͡ɕajp-* 'hug', *vella-* 'stand', *ŋvo-* 'begin', *palomtel-* 'hear', *tm-* 'kill'

c. Adjectival roots: *-ɣənɣəlo-* 'tall', *-lelepeja-* 'yellow', *-ŋot-* 'angry', *-qejalɣ-* 'cold', *-om-* 'hot'

d. Nominal affixes: *-ŋqo* 'ABL', *-epəŋ* 'PROL', *-etəŋ* 'ALL', *-ŋta* 'set out for', *-nv* 'place for'

e. Verbal affixes: *-la* 'PL', *-t͡ɕɣ* 'PEJ', *-ma* 'PRS.CVB', *-ŋvo* 'HAB'

f. Adjectival affixes: *ənan-* 'SPRL', *-ŋ* 'ADV'

g. Modals: *t͡ɕemot* 'no more', *janot* 'must'

h. Interjection: *ʔamto* 'hello', *ŋejaŋ* 'goodbye', *okkoj* 'eeek!'

When recessive or mixed morphemes cooccur with dominant ones in a word, the dominant morphemes cause *i* in the recessive morphemes to lower to *e*, *u* to lower to *o*, and *e* to lower to *a*. This is illustrated in (117).

(117) a. *ojatekeŋ*
ujetiki$_R$-ŋ$_D$
sled-DAT
'to a sled'

b. *ottəŋ*
utt$_R$-ə-ŋ$_D$
tree-EP-DAT
'to a tree'

c. *ɣat͡ɕat͡ɕkajoŋŋəvolenat*
ɣe$_R$-t͡ɕet͡ɕkejuŋ$_R$-ŋvo$_D$-line$_R$-t$_R$
UW.PST-think-INC-3.UW.PST-3DU
'they two began to think'

To make the comparison between forms easier, here is a 'paradigm' of the interactions of morphemes of various harmony classes with two of the recessive morphemes we've seen. The root for 'sled' that we saw above as *ujetik-* with the recessive instrumental suffix is realized as *ujatik-* with the mixed diminutive suffix, *ojateke-* with the dominant dative suffix. The root for 'tree' is *utt-* when the morphemes in the word are recessive or mixed, but becomes *ott-* when a dominant morpheme is added. The 3rd dual unwitnessed past form of the verb *t͡ɕet͡ɕkejuŋ-* 'think' follows the same pattern. What this comparison makes clear is that the vowels realized as *i* and *u* in recessive contexts have different behavior depending on the harmony class of the word as a whole. If it is mixed, they act as (non-opaque) transparent vowels, whereas if it is dominant, they are undergoers.

(118) a. *ujetikik*
ujetiki$_R$-k$_R$
sled-LOC
'in a sled'

b. *ujatikpiʎ*
ujetiki$_R$-piʎ$_M$
sled-DIM.ABS.SG
'little sled'

c. *ojatekeŋ*
ujetiki$_R$-ŋ$_D$
sled-DAT
'to a sled'

(119) a. *utte*
utt$_R$-e$_R$
tree-ERG
'tree'

b. *uttəpiʎ*
utt$_R$-ə-piʎ$_M$
sled-DIM.ABS.SG
'little tree'

c. *ottəŋ*
utt$_R$-ə-ŋ$_D$
tree-EP-DAT
'to a tree'

(120) a. *ɣet͡ɕet͡ɕkejuŋlinet*
ɣe$_R$-t͡ɕet͡ɕkejuŋ$_R$-line$_R$-t$_R$
UW.PST-think-3.UW.PST-3DU
'they two thought'

b. *ɣaqajt͡ɕat͡ɕkajuŋlinat*
ɣe$_R$-qaj$_M$-t͡ɕet͡ɕkejuŋ$_R$-line$_R$-t$_D$
UW.PST-DIM-think-3.UW.PST-3DU
'they two thought a bit'

c. *ɣat͡ɕat͡ɕkajoŋŋəvolenat*
ɣe$_R$-t͡ɕet͡ɕkejuŋ$_R$-ŋvo$_D$-line$_R$-t$_R$
UW.PST-think-INC-3.UW.PST-3DU
'they two began to think'

The examples of dominant morphemes presented here have so far been affixes. As we saw with the mixed morphemes in (114), dominant roots induce the same vocalism on affixes that dominant affixes induce on roots (121). For example, the ergative/instrumental suffix, which we saw as *-(t)e* in recessive contexts, is *-(t)a* in mixed and dominant contexts, in line with the vowel alternations we saw in roots. The diminutive suffix that is realized as *-piʎ* when attached to a recessive or mixed root is realized as *-peʎ* when attached to a dominant root, also in line with the vowel alternations we saw in roots. Finally, the 3rd dual unwitnessed past circumfix realized as *ɣe- -line-t* with a recessive stem and *ɣa- -lina-t* with a mixed stem is realized as *ɣa- -lena-t* with a dominant stem, in line with the vowel alternations we saw in roots.

(121) a. *qoja-ta*
qoja$_D$-te$_R$
reindeer-INST
'by reindeer'

b. *jaja-peʎ*
jaja$_D$-piʎ$_M$
house-DIM.ABS.SG
'small house'

c. *ɣa-nm-ə-lena-t*
ɣe$_R$-tm$_D$-ə-line$_R$-t$_R$
UW.PST-kill-EP-3.UW.PST-3DU
'X killed them two'

Further evidence that the harmony class of a morpheme is not predictable from its segmental composition comes from the minimal pair *-t͡ɕɣ* 'PL' and *-t͡ɕɣ* 'PEJ', the former of which is recessive and the latter of which is dominant, as illustrated in (122).

(122) a. *eɲpit͡ɕ*
eɲpit͡ɕ$_R$
father.ABS.SG
'father'

b. *eŋpitɕ͡itɕ͡ɣin*
eŋpitɕ͡i$_R$-tɕ͡ɣ$_R$-in$_R$
father-PL-POSS.SG
'parents"

c. *aŋpetɕ͡etɕ͡ɣən*
eŋpitɕ͡i$_R$-tɕ͡ɣ$_D$-ə-n$_R$
father-PEJ-EP-ABS.SG
'a damn father'

We have already seen that dominant morphemes cause the *i* and *u* of both recessive and mixed morphemes and the *e* of recessive morphemes to change. At this point, we might want to draw the following conclusion: dominant morphemes require other morphemes in their word to change their vocalism, along the lines of various phenomena discussed under the heading of transderivational antifaithfulness (Alderete 2001). To see if this is correct, we need to combine dominant morphemes with morphemes that contain vowels that have already been lowered by other morphemes in the same word. If those already-lowered vowels change, the transderivational antifaithfulness analysis is onto something. In fact, those vowels do not change: adding a dominant morpheme to a word with only recessive and mixed morphemes will cause the *i* and *u* to lower to *e* and *o*, respectively, but will not affect the *a*. Compare (123a), which we've seen before, with (123b), the same word with the dominant ablative suffix added to it. The *e* of the root is lowered to *a* by the diminutive suffix, and when the ablative suffix is subsequently added to it, the high vowels lower, and the *a* remains the same. The two verb forms in (124) exemplify the same thing, this time where the dominant morpheme is a root incorporated into the verb.

(123) a. *ujatikpiʎ*
ujetiki$_R$-piʎ$_M$
sled-DIM.ABS.SG
'a small sled'

b. *ojatekpeʎʎaqəŋqo*
ujetiki$_R$-piʎʎaq$_M$-ə-ŋqo$_D$
sled-DIM-EP-ABL
'from a small sled'

(124) a. *ɣa-kumŋ-al-lin*
ɣe$_R$-kumŋ$_M$-et$_R$-lin$_R$
UW.PST-call.out-VBLZ-3.UW.PST.SG
'(s)he called out'

b. *ɣa-ŋotə-komŋ-al-len*
ɣe$_R$-ŋotə$_D$-kumŋ$_M$-et$_R$-lin$_R$
UW.PST-angry-call.out-VBLZ-3.UW.PST.SG
'(s)he called out angrily'

In a similar vein, and given that dominant morphemes cause *i* to lower to *e* and *e* to lower to *a*, an account of these facts that was based on dominant morphemes requiring requiring other morphemes to change their vowels would predict that the change of *i* to *e* triggered by one dominant morpheme should feed the lowering of *e* to *a* if another dominant morpheme is added. This also is not the case, as the examples in (125-127) demonstrate. In each of these pairs, the word in (a) is one that we have seen before where a dominant morpheme was added to a recessive one. The word in (b) has an additional dominant morpheme added to it.[11] As we see, the vocalism is identical: the addition of another dominant morpheme does not cause the *i* to *e* lowering to feed *e* to *a* lowering, nor does it result in any other vowel changes in the word.

(125) a. *ojatekeŋ*
ujetiki$_R$-ŋ$_D$
sled-DAT
'to a sled'

b. *ojateketɕ͡ɣəŋ*
ujetiki$_R$-tɕ͡ɣ$_D$-ə-ŋ$_D$
sled-PEJ-EP-DAT
'to a damn sled'

(126) a. *ottəŋ*
utt$_R$-ə-ŋ$_D$
tree-EP-DAT
'to a tree'

b. *ŋanenottəŋ*
ŋanen$_D$-utt$_R$-ə-ŋ$_D$
that-tree-EP-DAT
'to that tree'

(127) a. *ɣat͡ɕat͡ɕkajoŋŋəvolenat*
ɣe$_R$-t͡ɕet͡ɕkejuŋ$_R$-ŋvo$_D$-line$_R$-t$_R$
UW.PST-think-INC-3.UW.PST-3DU
'they two began to think'

b. *ɣat͡ɕat͡ɕkajoŋət͡ɕɣaŋŋəvolenat*
ɣe$_R$-t͡ɕet͡ɕkejuŋ$_R$-ə-t͡ɕɣ$_D$-et$_R$-ŋvo$_D$-line$_R$-t$_R$
UW.PST-think-EP-PEJ-VBLZ-INC-3.UW.PST-3DU
'those damn two began to think'

The examples above show a variety of different ways in which morphemes that can affect other ones. In fact, in the most conservative varieties of Koryak (which are attested in documents from the early 20th century, and still exist intact in some speakers), any

[11] In (127b), there is also a verbalizer added to the word: the pejorative suffix requires a verbalizer when it attaches to verbs.

morpheme in the word will affect every other one. This pattern is made surprising by two facts: that directionality and locality are usually important restrictions on the spreading of vowel harmony in the languages of the word, and that Koryak has extensive synthesis and compounding. To establish this, I will now provide what I think is an exhaustive list of the types of vowel-harmony interactions that we can find in Koryak (some of which we have already seen).

(128) Root onto prefixes and suffixes

a. *nakunkaʎitɕ͡itawŋənaw*
ne$_R$-ku$_R$-n$_R$-kaʎi$_M$-tɕ͡it$_R$-ev$_R$-ŋ$_R$-ne$_R$-w$_R$
INV-PRS-CAUS-study-RECIP.VBLZ-VBLZ-PRS-3.O-3PL
'they are making them study'

b. *ɣajqəkalita*
ɣejqə$_R$-kali$_M$-te$_R$
COM-book-COM
'with a book'

c. *ɣa-nm-ə-lena-t*
ɣe$_R$-tm$_D$-ə-line$_R$-t$_R$
UW.PST-kill-EP-3.UW.PST-3DU
'X killed them two'

d. *tojəkjajɣotɕ͡awŋəpəkjatɕ͡əko*
tujək$_R$-jejɣutɕ͡ewŋ$_R$-ə-pək$_?$-ja$_D$-tɕ͡əku$_R$
2NSG.POSS-study-EP-piece?-house-IN
'in your classroom'

(129) Suffix onto root (including names) and prefix (and further suffixes)

a. *weʎqojmatakjavətɕ͡ɣən*
wiʎ$_R$-qujme$_R$-tekjev$_R$-ə-tɕ͡ɣ$_D$-ə-n$_R$
sour-crotch-Tekjew-EP-PEJ-EP-ABS.SG
'damn sour-crotched Tekjew'

b. *tawʔaltəʔuʎpiʎ*
tewʔel$_R$-təʔuʎ$_R$-piʎ$_M$
dried.fish-PART-DIM.ABS.SG
'a small piece of dried fish'

c. *mojəkkomŋəŋ*
mujək$_R$-kumŋ$_M$-ə-ŋ$_D$
1NSG.POSS-cry-EP-DAT
'(in response) to our cry'

d. *nakotɕ͡vetkoŋvoŋnaw*
ne$_R$-ku$_R$-tɕ͡vi$_R$-tku$_R$-ŋvo$_D$-ŋ$_R$-ne$_R$-w$_R$
INV-PRS-cut-PLUR-HAB-PRS-3.O-3PL

‘they (habitually) cut them up’

(130) Prefix onto root and suffix (and further prefixes)

a. *ənanmajŋətɕ͡ʔəkjet*
ənan$_{D}$-mejŋ$_{R}$-ə-tɕ͡ʔ$_{R}$-ə-kjit$_{R}$
SPRL-big-EP-NMLZ-EP-NARR
‘about the biggest one’

b. *taŋtitiŋa*
taŋ$_{M}$-titi$_{R}$-ŋe$_{R}$
RIP-needle-ABS.SG
‘a good needle that is now broken’

c. *ənnanqajmiʎutata*
ənnen$_{R}$-qaj$_{M}$-miʎute$_{R}$-te$_{R}$
one-DIM-hare-ERG
‘one young hare’

d. *ŋanenottətatqopɣeŋkə*
ŋanen$_{D}$-utt$_{R}$-ə-tatqup$_{M}$-ɣiŋ$_{R}$-k$_{R}$-ə
DIST.DEM-tree-EP-root-SUB-LOC-EP
‘at the foot of that tree stump’

(131) Dependent element of a compound/incorporation complex onto the rest of the word

a. *awətwətkeottəʎqək*
e$_{R}$-wətwət$_{D}$-ki$_{R}$-utt$_{R}$-ə-ʎq$_{R}$-ə-k$_{R}$
PRIV-leaf-PRIV-tree-EP-SUP-EP-LOC
‘on top of a leafless tree’

b. *ɣəjɲikənmajŋawkinaw*
ɣəjɲik$_{M}$-ə-n$_{R}$-mejŋ$_{R}$-ew$_{R}$-kine$_{R}$-w$_{R}$
animal-EP-CAUS-big-VBLZ-ADJ-3PL
‘animal-raising (adj.)’

c. *qojanomakavəpʎətkok*
qoja$_{D}$-n$_{R}$-umek$_{R}$-ev$_{R}$-ə-pʎətku$_{R}$-k$_{R}$
reindeer-CAUS-gather-VBLZ-EP-finish-PST.CVB
‘having finished gathering the reindeer’

d. *ɣaqejalɣələqlaŋjoʔəlen*
ɣe-qejalɣ$_{D}$-ə-ləqleŋ$_{R}$-juʔ$_{R}$-ə-lin$_{R}$
UW.PST-cold-EP-winter-BEGIN-EP-3.UW.PST.SG
‘A cold winter began.’

(132) Head of a compound/incorporation complex onto the rest of the word

a. *ŋəjanmənɣa*
ŋəjen$_{R}$-mənɣ$_{D}$-e$_{R}$
two-hand-INST

'with two hands'

b. *təkokalejəlŋatəŋ*
t_R-ə-ku_R-$kali_M$-jəl$ŋ_D$-et_R-ə-$ŋ_R$
1SG.S/A-EP-PRS-book-read-VBLZ-EP-PRS
'I am reading a book.'

c. *ʔujamtawilʔukajŋən*
ʔujemtewil$ʔ_R$-u_R-kaj$ŋ_M$-ə-n_R
person-hunt-bear-EP-ABS.SG
'a man-hunting bear'[12]

d. *ʔompelɣəʎʔatəŋa*
ʔum$_R$-pil$ɣ_R$-ə-ʎʔatəŋa$_D$
fat-throat-EP-Ljhatynga.ABS.SG
'greedy Ljhatynga'

Let's review what has been shown so far. First, there are three classes of morphemes, and the vowels that a word can surface with is dependent on what classes its morphemes belong to. If all of the word's morphemes are recessive, it surfaces with *i*, *u*, *e*, and *ə*. If at least one morpheme is mixed, and none are dominant, it surfaces with *i*, *u*, *a*, and *ə*. And if at least one morpheme is dominant, it surfaces with *e*, *o*, *a*, and *ə*. Furthermore, the vowels that are realized as *i* and *u* in recessive or mixed contexts are lowered to *e* and *o* in dominant contexts, and the vowel realized as *e* in recessive contexts is realized as *a* in dominant and mixed contexts. Finally, the lowering of *i* to *e* never feeds the lowering of *e* to *a*. In the next section, I will propose an analysis of these facts that requires that non-schwa vowels be underlyingly unspecified, and that a limited set of sets of floating features be able to be associated with each morpheme. Like with the solution to the labial problem discussed in the previous chapter, this analysis will hinge on the permissibility of morpheme structure constraints.

3.4 Proposal

3.4.1 A Sketch

My analysis has two components. First, the vowel segments of Koryak (other than *ə*) are obligatorily underspecified: the feature that is responsible for the alternation ([Hi] for the vowel that alternates between *u* and *o*) is not present in the underlying representation. Second, a morpheme comes with one of three sets of floating features, which are responsi-

[12]The incorporating verb *-u* can mean either 'eat' or (less commonly) 'hunt.' This word could in principle, therefore, mean 'a man-eating bear.' The context in which this word is was found, as the title of a story in Vdovin and Jajletkan (1949, p. 59) in which a bear sneaks up on and attacks, but does not succeed in killing, a person, suggests that 'hunt' is the correct interpretation here.

ble for realizing both the vowels of that morpheme, as well as the vowels that they trigger on other morphemes in the word.

I'll represent the underlying vowel inventory that I propose as /I/, /E/, /U/, /ə/, which are featurally defined in (133). The underlying vowel /I/, for example, surfaces as *i* or *e*, depending on whether it has a [+Hi] or a [–Hi] feature added to it. /E/, on the other hand, will be realized as *e* or *a*, depending on whether a [–Lo] or a [+Lo] feature is added to it. Note that *ə* is fully specified, as it never alternates. The sets of floating features a morpheme can come with are given in (134). If a morpheme is recessive, it comes with no further features other than the ones that its (underspecified) vowels are specified with; the rest are due to the emergence of the unmarked. On the other hand, if a morpheme is dominant, it comes with the feature set [+Lo,–Hi], which contributes values for all of the features that vowels can be underspecified for. These features then spread across the word to provide the rest of the morphemes in it with vowel features.

(133) a. /I/ = [–Lo,–Bk,+Fr] (surfaces as *i* or *e*)

b. /U/ = [–Lo,+Bk,–Fr] (surfaces as *u* or *o*)

c. /E/ = [–Hi,–Bk,+Fr] (surfaces as *e* or *a*)

d. /ə/ = [–Lo,–Hi,–Bk,–Fr] (surfaces as *ə*)

(134) a. ∅ (recessive)

b. [+Lo] (mixed)

c. [+Lo,–Hi] (dominant)

Morphemes of Koryak can only draw on these elements for specifying their vowels; as I will show, incorrect predictions follow from allowing harmony to be triggered from vowels themselves. On this way of setting up the possible underlying representations, dominance is specification: the more floating material a morpheme has for realizing its vowels, the more dominant it is. This is in line with a tradition beginning at least with Kiparsky (1982) that uses additional specification to account for phonological exceptionality. Further, if the constraint Integrity (which militates against spreading) is low-ranked for floating features, it follows that these floating features will spread, causing the morpheme with the most floating features to control the vowel pattern of the whole word. Finally, given that the recessive feature set is a proper subset of the mixed feature set, which is a proper subset of the dominant one, we derive the fact that the most dominant morpheme in the word is what determines the feature values for the whole word: the floating features of any less dominant morphemes are redundant.

3.4.2 In More Detail

Having sketched out my analysis, I will now present it in detail accompanied by relevant tableaux. These tableaux will consider progressively fewer candidates as the types of candidates that are eliminated by the highest-ranking constraints become evident. The highest-ranked relevant constraints are ***Uninterpretable** (henceforth ***Unint**), which bans uninterpretable (underspecified or contradictorily specified) segments in outputs, and **Integrity-Anchored** (henceforth **Int-Anch**), which militates against spreading non-floating features, for which I will use the nonstandard term 'anchored' features from here on out. The effect of ***Unint** is to prohibit underlyingly underspecified segments from surfacing as underspecified, and to prevent feature spreading and/or epenthesis from resulting in clashing featural specifications. **Int-Anch**, on the other hand, makes sure that no anchored features are the source of harmony; its ranking above **Integrity** (henceforth **Int**), an integrity constraint for any features, ensures that only non-anchored ones will spread.

(135) ***Uninterpretable**: Assign a violation to each candidate for each segment that is underspecified or contradictorily specified.

(136) **Integrity-Anchored**: Assign a violation to each candidate for each correspondence relationship in excess of one between an input anchored feature and an output feature.

(137) **Integrity**: Assign a violation to each candidate for each correspondence relationship in excess of one between an input feature and an output feature.

Next, we have some specific faithfulness constraints. The ID constraints penalize changing the value of Lo or Hi from the input to the output. Since the input segments are not specified for the features that change, the attested forms will never violate these constraints. These constraints will prevent /I/ (*i* in recessive environments) from being realized as *a* (by changing its [-Lo] feature to [+Lo]), and will also prevent /E/ (*e* in recessive environments) from being realized as *i*.

(138) **ID [Hi]**: Assign a violation to each candidate for each input-output pair of corresponding segments with different values for Hi.

(139) **ID [Lo]**: Assign a violation to each candidate for each input-output pair of corresponding segments with different values for Lo.

Given that dominance is feature specification in the account of the Koryak data that I propose, we need to have a way for the features necessary to turn the underspecified underlying forms into the recessive vowels to appear. For that I appeal to the emergence of the unmarked. Specific DEP constraints will penalize candidates that epenthesize [+Hi]

or [–Lo], which don't occur in recessive morphemes.[13]

(140) **DEP [–Hi]**: Assign a violation to each candidate for each [–Hi] feature that has no correspondent in the output.

(141) **DEP [+Lo]**: Assign a violation to each candidate for each [+Lo] feature that has no correspondent in the output.

The tableau in (142) shows how to derive *ujetik* 'sled' from an underlying representation consistent with the morpheme structure constraints I've proposed. Since it is a recessive morpheme, it has no floating features. Candidate (a) is eliminated for having underspecified vowels in the output, though it is the only candidate to satisfy the lower-ranked DEP and Integrity constraints, as it simply leaves the underspecified vowels underspecified. Candidate (b) is the winner; its only violations come from epenthesizing one instance each of [+Hi] and [–Lo]. Why is there only one instance of [+Hi] epenthesized, given that two vowels in this candidate (*u* and *i*) have a [+Hi] feature that they lack in the input? Integrity only assigns violations for elements present in both the input and the output, and consequently does not penalize epenthesized features for spreading. Given the ranking of DEP, it is preferable to epenthesize only one feature and spread it across the word to the positions where it is needed. I use the term 'spread' here loosely, not in the autosegmental sense. I assume instead that spreading is implemented using correspondence, that is, that the [+Hi] feature on the *u* and *i* share an index, such that the grammar treats them as one feature for the purposes of DEP violations. Now, we could epenthesize a [+Hi] feature separately for each of the two high vowels, as shown in candidate (c), but doing this merely results in gratuitous DEP violations. I will therefore not consider candidates that epenthesize more than one instance of each feature. Like candidates (b) and (c), candidates (d) and (e) have the same surface form but are derived by different means. In (d), [–Hi] has spread from the E onto the other vowels, which is banned by the maximally-ranked Int-Anch. In (e), [–Hi] (the marked value of [Hi]) is epenthesized, leading to the fatal violation. Candidate (f) has a superset of the violations of candidate (e) as it also epenthesizes a [+Lo], treating this morpheme as though it were dominant. Candidate (g) epenthesizes only a [+Lo], thereby applying the mixed vocalism to it, and giving it a fatal

[13] Jelena Stojković (p.c.) wonders whether the ranking of these DEP constraints over DEP [+Hi] and DEP [–Lo] introduces a problem for the analysis, by predicting that the epenthetic vowel of Koryak should be a high vowel. As we have seen, this is an incorrect prediction: the epenthetic vowel of Koryak is the mid central vowel *ə*. This prediction, however, is predicated on the idea that the quality of epenthetic segments is determined by TETU, a view that has been advanced in Kager (1999) and Lombardi (2002), a. o. However, this view has been seriously challenged by Steriade (2009), who shows (among other things) that the quality of epenthetic vowels is governed not by markedness constraints but by faithfulness constraints requiring maximum similarity across related forms. Such a requirement results in the least obtrusive vowel being picked as the epenthetic one. Indeed, the Koryak schwa appears to be the least obtrusive vowel in the system, given that it usually rejects stress when found in an open syllable and, when it is stressed, does not undergo lengthening like all other vowels in stressed open syllables do.

violation. Candidate (h) realizes E as *i*, incurring a violation of ID [Hi]. Since E is never realized as *i*, I will omit such candidates (and this constraint) in the rest of the tableaux.

(142)

UjEtIk			*Unint	Int-Anch	ID-Hi	ID-Lo	DEP [–Hi]	DEP [+Lo]	DEP	Int
a.		UjEtIk	*!**							
b.	☞	ujetik$_1$							**	
c.		ujetik$_2$							***!	
d.		ojetek$_1$		*!*					*	**
e.		ojetek$_2$					*!		**	
f.		ojatek					*!	*!	**	
g.		ujatik						*!	**	
h.		ujitik			*!				*	

Having shown that these constraints successfully map the underspecified underlying representations onto licit surface forms, I will now show that they are also sufficient to account for the full set of harmony behavior triggered by floating features. It may come as a surprise that these constraints are enough to analyze feature spreading, as there are no constraints (such as Agree, Align, Spread, etc.) enforcing this. However, the low ranking of general Integrity and the high ranking Int-Anch makes it so that the least marked solution is to spread floating features across the word.

Let's take a look at how this works when we combine a recessive and a mixed morpheme, as in (143). Candidate (a) associates the floating [+Lo] of the affix with the /E/ vowel of the root, but leaves the other vowels underspecified. Consequently, it avoids violating both DEP and Int, but at the cost of three fatal violations of *Unint. Candidate (b) spreads the floating [+Lo] onto the first vowel, resulting in a segment that is specified in a contradictory way.[14] This also gives it three violations of the constraint against uninterpretable segments. Candidates (c) and (d) treat the suffix as though it were recessive as they do not realize the second root vowel as *a*. In the former case, this is by epenthesizing a [+Hi] feature that is shared by three vowels, and a [–Lo] feature for /E/. In the latter case, it is by spreading an anchored [–Lo] from either /U/ or /I/ onto /E/, incurring a violation of Int-Anch (and, by necessity, general Integrity). Compared to the winning candidate (e), candidate (c) has an additional DEP violation since it did not take advantage of the existence of a [+Lo] feature in the input. Candidates (f) and (g) both treat the suffix as a dominant one, in the first case by epenthesizing the marked value of Hi, which is

[14] I omit the backness features for reasons of space.

shared by three segments, and in the second case by spreading the [–Hi] of /E/ to three segments, giving three violations of Int-Anch. Finally, candidate (h) realizes the /I/ as *a* by spreading the floating feature onto it. This violates ID-Lo, and also triggers a violation of Integrity as the feature [+Lo] is associated with two segments.

(143)

UjEtIk-pIʎ[+Lo]		*Unint	Int-Anch	ID-Lo	DEP [–Hi]	DEP [+Lo]	DEP	Int
a.	UjatIkpIʎ	*!**						
b.	[$^{-Lo}_{+Lo}$]jatIkpIʎ	*!**						
c.	ujetikpiʎ$_1$						**!	
d.	ujetikpiʎ$_2$		*!				*	*
e. ☞	ujatikpiʎ						*	
f.	ojatekpeʎ$_1$				*!		*	
g.	ojatekpeʎ$_2$		*!**					***
h.	ojatakpeʎ			*!	*!		*	

The tableau in (144) shows the same thing as (143), but with a dominant morpheme. Here, candidate (a) ignores the floating features, instead epenthesizing the unmarked feature values of Hi and Lo. This leads to two violations of DEP. A subset of these violations are accrued by candidate (b), which epenthesizes only [+Hi]. The winning candidate, (c), makes use of both of the floating features provided by the affix, incurring equally more integrity violations as the other ones (since the [-Hi] spreads to the three segments that are not specified as such in the input, there are two violations of Integrity), but without their DEP violations. Candidate (d) has the [-Hi] feature spreading to three segments, incurring two violations of Integrity, but also spreads the [+Lo] floating feature to all four segments, adding three more Integrity violations. Additionally, since the vowels E and I are underlyingly specified as [-Lo], the replacement of this feature with [+Lo] results in three violations of ID-Lo.

(144)

UjEtIkI-ŋ[+Lo, –Hi]		*Unint	Int-Anch	ID-Lo	DEP [–Hi]	DEP [+Lo]	DEP	Int
a.	ujetikiŋ						*!*	
b.	ujatikiŋ						*!	
c. ☞	ojatekeŋ							**
d.	ɑjatakaŋ			*!**				*****

At this point it is worth pointing out something that is perhaps counterintuitive. In (143), the floating feature is [+Lo], and nonetheless the vowels U and I are realized as their [+Hi] variants *i* and *u*, whereas when the floating features are [+Lo] *and* [–Hi], they are realized as *e* and *o*, as in (144). This is because of the combined effects of ID-Lo and DEP [–Hi]. The first constraint generally prevents the floating [+Lo] from being realized on I and U, as they are underlyingly [-Lo]. They are also not realized as mid vowels when the only floating feature is [+Lo] because of the high ranking of DEP [–Hi], which makes it preferable to epenthesize [+Hi]. However, in (144), a [–Hi] is provided by the affix, and the ranking of DEP > Int makes it preferable to spread the floating feature than to epenthesize anything. This results in the I and U being realized as *e* and *o*.

The tableaux in (145) and (146) show how monomorphemic mixed and dominant words' vowels are realized. Nothing in the analysis makes reference to morpheme boundaries, so these cases work identically to (143) and (144).

(145)

kElIkEl[+Lo]		*Unint	Int-Anch	ID-Lo	DEP [–Hi]	DEP [+Lo]	DEP	Int
a.	kelikel						**!	
b. ☞	kalikal						*	*
c.	kalekal				*!		*	*
d.	kalikel						**!	

(146)

ʔUjEt͡ɕIk[+Lo,-Hi]		*Unint	Int-Anch	ID-Lo	DEP [–Hi]	DEP [+Lo]	DEP	Int
a.	ʔujet͡ɕik						*!*	
b.	ʔujat͡ɕik						*!	
c. ☞	ʔojat͡ɕek							*
d.	ʔojat͡ɕak			*!				*

Finally, the tableau in (147) shows that this account correctly predicts the lack of a feeding relationship between the *i/e* alternation and the *e/a* one when there are two dominant morphemes. This is enforced by the highly-ranked ID-Lo constraint, as above. This tableau also brings up the issue of the schwa. Being fully specified in the input, the high ranking of ID-Lo constraints means that it cannot be realized as *a* due to the presence of [+Lo] in the floating feature set (it also can't be realized as a high vowel due to ID-Hi, which is not shown here.)

(147)

ʔUjEt͡ɕIk$^{[+\text{Lo,-Hi}]}$-Itəŋ$^{[+\text{Lo,-Hi}]}$	*Uninit	Int-Anch	ID-Lo	DEP [–Hi]	DEP [+Lo]	DEP	Int
a. ʔujet͡ɕikitəŋ						*!	
b. ☞ ʔojat͡ɕeketəŋ							*
c. ʔojat͡ɕaketəŋ			*!				*
d. ʔojat͡ɕeketaŋ			*!				*

In this subsection, I've shown how Koryak vowel harmony can be handled in a system of ranked constraints if we assume strict restrictions on what kind of vowel segments and floating features can be in the underlying representation. The key here is to have harmony triggered by floating features, which accounts for the fact that morphemes' vowels systematically underdetermine their harmony pattern, and to implement dominance as featural specification, which derives the fact that dominant morphemes impose their harmony on the word regardless of where they are in the word or how many non-dominant morphemes the word contains. When this is combined with the ranking Int-Anch > DEP > Int, the word-level spread of vowel harmony falls out automatically. What I haven't done in this subsection is shown how to derive the limited inventory of underlying vocalic elements I proposed. That is the subject of the next subsection.

3.4.3 The MSC Grammar

We saw above how a grammar making use of only the vocalic elements in (148) and (149) can derive the vowel harmony patterns of Koryak. But how do we ensure that only these elements are used in the underlying representations of Koryak morphemes? In this subsection, I present an OT grammar for the morpheme level that derives this inventory. The goal here is to to have a grammar that will take anything that the rich base could provide and map it onto a possible underlying representation of Koryak.

(148) a. /I/ = [–Lo,–Bk,+Fr] (surfaces as *i* or *e*)

b. /U/ = [–Lo,+Bk,–Fr] (surfaces as *u* or *o*)

c. /E/ = [–Hi,–Bk,+Fr] (surfaces as *e* or *a*)

d. /ə/ = [–Lo,–Hi,–Bk,–Fr] (surfaces as *ə*)

(149) a. ∅ (recessive)

b. [+Lo] (mixed)

c. [+Lo,–Hi] (dominant)

Let's first concentrate on the vowels themselves. As we can see in (148), none of the vowels have the features [+Lo] or [+Hi]. Additionally, the only vowel with both [-Lo] and [–Hi] is *ə*, which is neither [+Fr] nor [+Bk]. These facts motivate the following undominated markedness constraints:

(150) ***+Lo**: Assign a violation to each candidate for each instance of [+Lo]

(151) ***+Hi**: Assign a violation to each candidate for each instance of [+Hi]

(152) ***–Lo,–Hi,+Fr**: Assign a violation to each candidate for each feature bundle that contains –Lo,–Hi, and +Fr

(153) ***–Lo,–Hi,+Bk**: Assign a violation to each candidate for each feature bundle that contains –Lo,–Hi, and +Bk

Let's consider an input /a/ to see whether these constraints derive a licit output. The markedness constraints above successfully eliminate all fully specified candidates other than schwa, but this leaves us with a four-way tie. To resolve this, we add a general Ident constraint, which penalizes candidates for each input feature value not found in the output. This resolves the tie, making /E/ the winner.

(154)

/+Lo,–Hi,–Bk,+Fr/ = /a/	*+Lo	*+Hi	*–Lo,–Hi,+Fr	*–Lo,–Hi,+Bk	ID
a. [+Lo,–Hi,–Bk,+Fr] = a	*!				
b. ☞ [–Hi,–Bk,+Fr] = E					*
c. [–Lo,–Hi,–Bk,–Fr] = ə					**!
d. [–Lo,–Hi,+Bk,–Fr] = o				*!	***
e. [–Lo,–Hi,–Bk,+Fr] = e			*!		*
f. [–Lo,+Bk,–Fr] = U					**!**
g. [–Lo,+Hi,+Bk,–Fr] = u		*!			****
h. [–Lo,+Hi,–Bk,+Fr] = i		*!			**
i. [–Lo,–Bk,+Fr] = I					**!

If the input is *e*, however, we need a further constraint. As the tableau in (155) shows, evaluating the candidates through the faithfulness constraint leads to a three way tie between E, I, and *ə*. In principle, any of these candidates would work. To select one, we need to add a lower-ranked markedness constraint, though as far as I can tell it doesn't make much of a difference here which one we add. Where it will make a difference, however, is when the input is /o/, the back equivalent of /e/. If the constraint we add is *-Lo, the input /o/ will be mapped to the feature set [-Hi, + Bk,-Fr] (the back version of E). Since that feature set does not exist in underlying representations[15], we should pick *-Hi as the additional markedness constraint. This causes I to be the winner.

(155)

/–Lo,–Hi,–Bk, + Fr/ = /e/		*+Lo	*+Hi	*–Lo,–Hi,+Fr	*–Lo,–Hi,+Bk	ID	*–Hi
a.	[+ Lo,–Hi,–Bk, + Fr] = a	*!				*	*
b.	[–Hi,–Bk, + Fr] = E					*	*!
c.	[–Lo,–Hi,–Bk,–Fr] = ə					*	*!
d.	[–Lo,–Hi, + Bk,–Fr] = o				*!	**	*
e.	[+ Lo,–Hi, + Bk,–Fr] = ɑ	*!				***	*
f.	[–Lo,–Hi,–Bk, + Fr] = e			*!			*
g.	[–Lo, + Bk,–Fr] = U					**!*	
h.	[–Lo, + Hi, + Bk,–Fr] = u		*!			***	
i.	[–Lo, + Hi,–Bk, + Fr] = i		*!			*	
j. ☞	[–Lo,–Bk, + Fr] = I					*	

It should be clear at this point that any of the attested surface vowels of Koryak will give a licit output when evaluated against these constraints: /a/ will surface as E, /i/ and /e/ as I, /u/ and /o/ as U, and /ə/ as *ə*. Other vowels generated by these features will also give licit outputs: high and low central vowels will be mapped to *ə*. However, a low back vowel (/ɑ/) input will cause an issue if the grammar contains only those constraints we have so far, as it will be realized as the unattested [–Hi, + Bk, –Fr]. Consequently, we need to add an additional constraint banning segments from having the feature bundle [–Hi, + Bk, –Fr]. As the tableau in (157) shows, this leads to an input /ɑ/ being realized as U, which is one of the licit underlying representations.

(156) ***–Lo,–Hi, + Bk**: Assign a violation to each candidate for each feature bundle that contains –Lo,–Hi, and + Bk

[15] If it did, it would lead to an *o* in a recessive morpheme.

(157)

/+Lo,–Hi,+Bk,–Fr/ = /ɑ/		*+Lo	*+Hi	*–Lo,–Hi,+Fr	*–Lo,–Hi,+Bk	*–Hi,+Bk	ID	*–Hi
a.	[+Lo,–Hi,–Bk,+Fr] = a	*!					**	*
b.	[–Hi,–Bk,+Fr] = E						***!	*
c.	[–Lo,–Hi,–Bk,–Fr] = ə						**	*!
d.	[–Lo,–Hi,+Bk,–Fr] = o				*!	*!	*	*
e.	[+Lo,–Hi,+Bk,–Fr] = ɑ	*!				*!		*
f.	[–Lo,–Hi,–Bk,+Fr] = e			*!			*	*
g. ☞	[–Lo,+Bk,–Fr] = U						**	
h.	[–Lo,+Hi,+Bk,–Fr] = u		*!				**	
i.	[–Lo,+Hi,–Bk,+Fr] = i		*!				****	
j.	[–Lo,–Bk,+Fr] = I						***!*	
k.	[–Hi,+Bk,–Fr] = O					*!	*	*

The following tableaux show that the inputs /–Lo,+Bk,–Fr/ and crucially /–Hi,+Bk,–Fr/ are mapped onto U, a licit vowel for underlying representations. It is trivial to calculate that /–Lo,–Bk,+Fr/ and /–Hi,+Bk,–Fr/ will be faithfully mapped onto I and E respectively.[16]

[16] I assume that Specify-Bk and Specify-Fr (Dresher 2009), which assign violations to candidates that are not specified for backness and frontness, respectively, are highly ranked, so as to force inputs that are not specified for backness to epenthesize such features. Which features specifically are epenthesized will be determined by markedness constraints, and I don't think that the choice of features matters. That is, regardless of the feature values epenthesized, this grammar will output a suitable underlying representation.

(158)

/–Lo,+Bk,–Fr/ = /U/		*+Lo	*+Hi	*–Lo,–Hi,+Fr	*–Lo,–Hi,+Bk	*–Hi,+Bk	ID	*–Hi
a.	[+Lo,–Hi,–Bk,+Fr] = a	*!					***	*
b.	[–Hi,–Bk,+Fr] = E						*!**	*
c.	[–Lo,–Hi,–Bk,–Fr] = ə						*!*	*
d.	[–Lo,–Hi,+Bk,–Fr] = o				*!	*!	**	*
e.	[+Lo,–Hi,+Bk,–Fr] = ɑ	*!				*!	*	*
f.	[–Lo,–Hi,–Bk,+Fr] = e			*!			***	*
g.	☞ [–Lo,+Bk,–Fr] = U							
h.	[–Lo,+Hi,+Bk,–Fr] = u		*!					
i.	[–Lo,+Hi,–Bk,+Fr] = i		*!				**	
j.	[–Lo,–Bk,+Fr] = I						*!*	

(159)

/–Hi,+Bk,–Fr/ = O		*+Lo	*+Hi	*–Lo,–Hi,+Fr	*–Lo,–Hi,+Bk	*–Hi,+Bk	ID	*–Hi
a.	[+Lo,–Hi,–Bk,+Fr] = a	*!					**	*
b.	[–Hi,–Bk,+Fr] = E						**!	*
c.	[–Lo,–Hi,–Bk,–Fr] = ə						*	*!
d.	[–Lo,–Hi,+Bk,–Fr] = o				*!	*!		*
e.	[+Lo,–Hi,+Bk,–Fr] = ɑ	*!				*!		*
f.	[–Lo,–Hi,–Bk,+Fr] = e			*!			**	*
g.	☞ [–Lo,+Bk,–Fr] = U						*	
h.	[–Hi,+Bk,–Fr] = O					*!		*
i.	[–Lo,+Hi,+Bk,–Fr] = u		*!				*	
j.	[–Lo,+Hi,–Bk,+Fr] = i		*!				***	
k.	[–Lo,–Bk,+Fr] = I						**!*	

What is somewhat less trivial to calculate is the behavior of the other combinations of features that underspecify the vowels but are not licit outputs in their own right, namely, ones with [+Hi] or [+Lo] features. The tableau in (160) shows that the input /+Hi,–Bk,+Fr/ will be mapped onto I, and by the same logic its back variant will be mapped onto U. The tableaux in (161) and (162) show the mapping of /+Lo,+Bk,–Fr/ and /+Lo,–Bk,+Fr/ onto U and E respectively. Note that the former maps onto a [–Lo] vowel, whereas

the latter maps onto a [–Hi] one. This ensured by the constraint *–Hi, + Bk, which is necessary because [–Hi, + Bk,–Fr] is not a licit output in this system.

(160)

/+Hi,–Bk,+Fr/	*+Lo	*+Hi	*–Lo,–Hi,+Fr	*–Lo,–Hi,+Bk	*–Hi,+Bk	ID	*–Hi	Max
a. [+Hi,–Bk,+Fr]		*!						
b. [–Hi,–Bk,+Fr] = E						*!	*	
c. ☞ [–Lo,–Bk,+Fr] = I								*

(161)

/+Lo,+Bk,-Fr/	*+Lo	*+Hi	*–Lo,–Hi,+Fr	*–Lo,–Hi,+Bk	*–Hi,+Bk	ID	*–Hi	Max
a. [+Lo,+Bk,–Fr]	*!							
b. [–Hi,+Bk,–Fr] = O					*!		*	*
c. ☞ [–Lo,+Bk,–Fr] = U						*		

(162)

/+Lo,–Bk,+Fr/	*+Lo	*+Hi	*–Lo,–Hi,+Fr	*–Lo,–Hi,+Bk	*–Hi,+Bk	ID	*–Hi	Max
a. [+Lo,–Bk,+Fr]	*!							
b. ☞ [–Hi,–Bk,+Fr] = E							*	*
c. [–Lo,–Bk,+Fr] = I						*!		

Finally, we need to account for the floating features. Floating features have to be represented differently from anchored features, so I will represent them and the constraints that apply to them with the subscript F. Now we only need one markedness constraint indexed to floating features to allow –Hi only in the context of +Lo, and we derive the fact that –Hi cannot float on its own. The tableaux below show the results of applying the constraint ranking to the relevant inputs. Maximally-ranked markedness constraints will get rid of spurious floating features (e.g. +Hi, -Fr, ATR, etc.)

(163) **Lic –Hi$_F$ / +Lo$_F$**: Assign a violation to each candidate if it contains a floating –Hi and does not contain a floating +Lo

(164)

/ /$_F$	DEP$_F$	Lic –Hi$_F$ / +Lo$_F$	Max$_F$	ID$_F$
a. ☞ [ ]$_F$				
b. [+Lo]$_F$	*!			

(165)

/+Lo/$_F$	DEP$_F$	Lic –Hi$_F$ / +Lo$_F$	Max$_F$	ID$_F$
a. ☞ [+Lo]$_F$				
b. [ ]$_F$			*!	
c. [-Lo]$_F$				*!

(166)

/–Hi/$_F$	DEP$_F$	Lic –Hi$_F$ / +Lo$_F$	Max$_F$	ID$_F$
a. [–Hi]$_F$		*!		
b. ☞ [ ]$_F$			*	
c. [+Lo, –Hi]$_F$	*!			
d. [+Lo]$_F$			*	*!

(167)

/+Lo, –Hi/$_F$	DEP$_F$	Lic –Hi$_F$ / +Lo$_F$	Max$_F$	ID$_F$
a. ☞ [+Lo, –Hi]$_F$				
b. [+Lo]$_F$			*!	
c. [–Hi]$_F$		*!		

All features that do not play a role in the phonology of Koryak vowels (tongue-root position, pharyngealization, nasality, etc.) are eliminated from the inputs by highly-ranked markedness constraints against both of their feature values. Since these constraints outrank Max-Feature, the winning candidates will not include them.

3.4.4 Summary

In this section, I have presented a grammar that allows a rich base to be the input to the grammar of Koryak by having phonological evaluation proceed in two steps. First, though presented second, a morpheme structure constraint grammar maps various possible underlying representations onto a restricted set of underspecified vowels and concomitant floating features. Then, another set of constraints maps these underspecified vowels and floating features onto licit surface forms. One unusual aspect of this analysis is the fact that harmony is not driven by a markedness constraint like Agree or Spread, but is instead driven by the faithfulness constraint DEP and the low ranking of general Integrity.

Intuitively, this is because the harmony classes of Koryak cannot be unified on the basis of a single feature: no class contains only high vowels, only front vowel, etc. In the next section, we will see how analyses that allow for full feature specification, and therefore require constraints like Agree and Spread, do not work, which supports the idea that morpheme structure constraints are necessary to account for Koryak phonology.

3.5 Against MSC-less Analyses

I have now presented a grammar for underlying representations that derives the restricted set of vowels and floating features found in the morphemes of Koryak. But why was that necessary? In this section, I will argue that approaches that do not use morpheme structure constraints cannot account for the pattern we find in Koryak. Specifically, I will argue that since such approaches cannot account for the difference in behavior of floating and anchored features: if vowels are allowed to be fully specified, they cannot be blocked from triggering harmony, and if they are not blocked from triggering harmony, the system cannot predict the attested alternations.

Recall that the surface form of morphemes underdetermines their harmony class. For example, the adjectival roots *iwl-* and *ikm-* trigger different harmony despite having the same vowel (168), as do the segmentally identical possessive and pejorative suffixes *-t͡ɕɣ*, which have no vowels (169).

(168) a. *niwləqinet*
n$_R$-iwl$_R$-ə-qine$_R$-t$_R$
ADJ-tall-EP-ADJ-3DU
'tall (du.)'

b. *nikməqinat*
n$_R$-ikm$_M$-ə-qine$_R$-t$_R$
ADJ-short-EP-ADJ-3DU
'short (du.)'

(169) a. *ŋpit͡ɕit͡ɕɣin*
ŋpit͡ɕi$_R$-t͡ɕɣ$_R$-in$_R$
father-PL-POSS.SG
'parents"

b. *qŋpet͡ɕet͡ɕɣən*
ŋpit͡ɕi$_R$-t͡ɕɣ$_D$-ə-n$_R$
father-PEJ-EP-ABS.SG
'a damn father'

The fact that a morpheme's segments do not predict its harmony behavior means that

abstract features[17] need to be allowed to control harmony at least sometimes. I have taken the morphemes that require abstract features to represent a core part of the vowel harmony system, and, by having vowel harmony always controlled by floating features, have modeled all morphemes in the same way as them. However, this is not the only option; we might imagine that some morphemes, like the ones in (168-169), need to have their harmony represented abstractly, but others can have their harmony behavior triggered by their segments. This is, in fact, what ROTB predicts in a system with parallel evaluation: if both floating features and anchored features are licit in the input to the grammar, there is no way for underlying representations to be forced have the underspecified vowels and floating features that I posit. Consequently, doing away with morpheme structure constraints requires that harmony also be allowed to be triggered by the vowels themselves in certain cases. I will show that this is untenable.

Let's consider what an analysis along these lines would have to look like to. Recall the harmony classes of vowels: [i u e ə], [i u a ə], and [e o a ə]. A combination of markedness and faithfulness has to ensure that, for any input, all of the vowels of the word belong to one (and only one) of the classes. Let's begin with the recessive set, and with morphemes containing only a single vowel. Once we have found a constraint ranking that at least maps single input vowels onto acceptable surface ones, we can see how that grammar fares with combinations of vowels and morphemes. Given that the recessive set is the one that does not affect the vowels of the rest of the word, I'll assume that this set comes without floating features.[18] The tableaux below show that ranking the constraints *o and *[+Lo] above faithfulness constraints to height features maps the surface vowels of Koryak onto the recessive class.

(170)

i		*o	*+Lo	ID-Lo	ID-Hi
a. ☞	i				
b.	e				*!
c.	a		*!	*	*

[17] I've modeled this using floating features, which I suspect is the best way to do this given that it provides the most direct link between dominance and vowel quality. We could in principle encode dominance in another way, for example, with a diacritic, but then we would also have to explain why the diacritic's distribution mirrors the vowels', and also have a way for the diacritics to compete with each other. This is not impossible to do, but I suspect the resultant account of Koryak vowel harmony will have a lot more moving parts than necessary.

[18] Note that if a difference licit combination of vowels results from being passed through the constraints, we might find a way to derive the recessive set from a combination of vowels and floating features.

(171)

e	*o	* + Lo	ID-Lo	ID-Hi
a. ☞ e				
b. i				*!
c. a		*!	*	

(172)

o	*o	* + Lo	ID-Lo	ID-Hi
a. o	*!			
b. ☞ u				*

(173)

a	*o	* + Lo	ID-Lo	ID-Hi
a. a		*!		
b. ☞ e			*	
c. i			*	*!

To make sure that /ɑ/ does not surface faithfully (as the vowel is not present in the surface forms of Koryak), we add a highly-ranked markedness constraint banning it.[19]

(174)

ɑ	*ɑ	*o	* + Lo	ID-Lo	ID-Hi
a. ɑ	*!		*		
b. o		*!		*	
c. ☞ u				*	*

Now let's consider the mixed set. Recall that we need to map the *i* and *u* of the recessive set onto *i* and *u*, and the *e* of the recessive set onto *a*. I take mixed morphemes to come with a floating [+Lo] feature, whose realization is promoted by the constraint Max Floating [+Lo], defined in (175).We see immediately in (176) that this is not sufficient, as it causes an underlying /i/, realized as /i/ in the recessive set, to be realized as *a*. As discussed above, this never happens.

(175) **Max Fl [+Lo]**: Assign a violation for each instance of an input floating [+Lo] feature that is not realized in the output

[19] While * + Lo will do the trick for now, we will need *ɑ starting in (174).

(176)

i [+Lo]	*ɑ	Max Fl [+Lo]	*o	*+Lo	ID-Lo	ID-Hi
a. ☹ i		*!				
b. e		*!				*
c. 💣 a				*	*	*

To solve this, we can add the distantial faithfulness constraint in (177), which will penalize realizing /i/ as *a*. With this constraint in place, we correctly predict the mapping of /i/, /u/, /e/, /o/, and /a/ onto *i*, *u*, *a*, *u*, and *a*. This is what we want given these vowels' realization in the recessive environment. Note the two surface-identical candidates in (182): a_1 is derived by maintaining the [+Lo] feature of the input, whereas a_2 replaces it with the floating [+Lo] feature. Consequently, a_1 violates the Max Floating feature constraints, but a_2 does not.

(177) **Dist-Faith**: Assign a violation to each candidate for each underlying high vowel realized as low or underlying low vowel realized as high.

(178)

i [+Lo]	Dist-Faith *ɑ	Max Fl [+Lo]	*o	*+Lo	ID-Lo	ID-Hi
a. ☞ i		*				
b. e		*				*!
c. a	*!			*	*	*

(179)

u [+Lo]	Dist-Faith *ɑ	Max Fl [+Lo]	*o	*+Lo	ID-Lo	ID-Hi
a. ☞ u		*				
b. o		*	*!			*
c. ɑ	*!	*!		*	*	*

(180)

e [+Lo]	Dist-Faith *ɑ	Max Fl [+Lo]	*o	*+Lo	ID-Lo	ID-Hi
a. e		*!				
b. ☞ a				*	*	
c. i		*!				*

(181)

o [+Lo]	Dist-Faith	*ɑ	Max Fl [+Lo]	*o	*+Lo	ID-Lo	ID-Hi
a. o			*	*!			
b. ɑ		*!			*	*	
c. ☞ u			*				*

(182)

a [+Lo]	Dist-Faith	*ɑ	Max Fl [+Lo]	*o	*+Lo	ID-Lo	ID-Hi	Max Lo
a. a_1			*!		*			*
b. ☞ a_2					*			*
c. e			*!			*		**

What this ranking doesn't correctly predict is the behavior of an input /ɑ/, which is realized as *o*. Recall from (174) above that underlying /ɑ/ surfaces as *u*. Consequently, in a mixed environment, it must also surface as *u*. To fix this, we can tweak the distantial faithfulness constraint so that it only applies to front vowels, giving the constraint in (184). This gives us the attested mapping in (185).

(183)

ɑ [+Lo]	Dist-Faith	*ɑ	Max Fl [+Lo]	*o	*+Lo	ID-Lo	ID-Hi	Max Lo
a. $ɑ_1$		*!	*		*			*
b. $ɑ_2$		*!			*			*
c. 💣 o			*	*		*		**
d. ☹ u	*!		*			*	*	**

(184) **Dist-Faith-Fr**: Assign a violation to each candidate for each underlying front high vowel realized as low or underlying front low vowel realized as high.

(185)

ɑ [+Lo]	Dist-Faith-Fr	*ɑ	Max Fl [+Lo]	*o	*+Lo	ID-Lo	ID-Hi	Max Lo
a. $ɑ_1$		*!	*		*			*
b. $ɑ_2$		*!			*			*
c. o			*	*!		*		**
d. ☞ u			*			*	*	**

We can now proceed to the dominant morphemes. These will have to have the floating features [+Lo] and [–Hi]. The only constraint we need to add is the [–Hi] version of the Max floating feature constraint in (175), and as the following tableaux show, /i/, /u/, /e/, /o/, /a/, and /ɑ/ map onto *e*, *o*, *a*, *o*, *a*, and *o*, exactly what we need.

(186)

i [+Lo] [–Hi]	Dist-Faith-Fr	*ɑ	Max Fl [+Lo]	Max Fl [–Hi]	*o	*+Lo	ID-Lo	ID-Hi
a. i			*	*!				
b. ☞ e			*					*
c. a	*!					*	*	*

(187)

u [+Lo] [–Hi]	Dist-Faith-Fr	*ɑ	Max Fl [+Lo]	Max Fl [–Hi]	*o	*+Lo	ID-Lo	ID-Hi
a. u			*	*!				
b. ☞ o			*		*			*
c. ɑ	*!	*!				*	*	*

(188)

e [+Lo] [–Hi]	Dist-Faith-Fr	*ɑ	Max Fl [+Lo]	Max Fl [–Hi]	*o	*+Lo	ID-Lo	ID-Hi
a. e			*!					
b. ☞ a						*	*	
c. i			*!	*!				*

(189)

o [+Lo] [–Hi]	Dist-Faith-Fr	*ɑ	Max Fl [+Lo]	Max Fl [–Hi]	*o	*+Lo	ID-Lo	ID-Hi
a. ☞ o			*		*			
b. u			*	*!				*
c. ɑ		*!				*	*	

(190)

a [+Lo] [–Hi]	Dist-Faith-Fr	*ɑ	Max Fl [+Lo]	Max Fl [–Hi]	*o	*+Lo	ID-Lo	ID-Hi
a. ☞ a						*		
b. e			*!				*	
c. i	*!		*	*			*	*

(191)

ɑ [+Lo] [–Hi]	Dist-Faith-Fr	*ɑ	Max Fl [+Lo]	Max Fl [–Hi]	*o	*+Lo	ID-Lo	ID-Hi
a. ɑ		*!				*		
b. ☞ o			*		*		*	
c. u			*	*!			*	*

(192)

i-o	Dist-Faith-Fr	*ɑ	Max Fl [+Lo]	Max Fl [–Hi]	*o	*+Lo	ID-Lo	ID-Hi
a. io					*!			
b. ☞ iu								*
c. eo					*!			*
d. eu								**!

Having shown that we can account for the alternations of single vowels, I will now show how multiple vowels in the same word interact. In the end, we will see that this approach permitting full specification of underlying vowels results in the anchored vowel features triggering harmony, leading to ranking paradoxes. Consider first what happens if we combine a recessive /i/ with a dominant /o/. Given that they individually are realized as *i* and *o*, and that *i* and *o* do not coexist within a word in Koryak, some change will have to occur. In particular, the *i* will have to lower to *e*. As we see in the tableau in (193), this does not occur. Since the Max constraints only require that the relevant features be

realized *somewhere* in the candidate, the fact that the *o* has the floating [-Hi] feature is enough to satisfy that constraint.[20]

(193)

i - o [+Lo] [–Hi]	Dist-Faith-Fr *a	Max Fl [+Lo]	Max Fl [–Hi]	*o	*+Lo	ID-Lo	ID-Hi
a. 💣 io		*		*			
b. ☹ eo		*		*			*!
c. iu		*	*!				*
d. ao	*!			*	*	*	*

To solve this, we can introduce Agree constraints, which require that adjacent segments have the same value for a particular feature.[21] The addition of Agree constraints for the features Hi and Lo causes candidate (a) in (196) to not be selected, as its two segments are specified as [+Hi] and [–Hi], respectively. Instead, we get the expected *eu*, as it retains the floating [–Hi], and both of the vowels are of the same height.

(194) **Agree Hi**: Assign a violation to each candidate for each sequence of segments with different values for the feature Hi

(195) **Agree Lo**: Assign a violation to each candidate for each sequence of segments with different values for the feature Lo

(196)

i - o [+Lo] [–Hi]	Dist-Faith-Fr *a	Max Fl [+Lo]	Max Fl [–Hi]	Agree Hi	Agree Lo	*o	*+Lo	ID-Lo	ID-Hi
a. io		*		*!		*			
b. ☞ eo		*				*			*
c. iu		*	*!						*
d. au	*!			*	*		*	*	**
e. eu		*		*!					**

Where this goes awry is when both morphemes are recessive and the vowels are of different heights.[22] Consider the tableau in (197). Here, the high ranking of Agree-Hi

[20]Note that in order to satisfy Max Fl [–Hi], the anchored [–Hi] associated with the underlying /o/ has been deleted. This violates a general Max constraint that is low-enough ranked that it does not play a role in the analysis. The Max constraints that are not specifically for floating features will therefore no longer be shown in the tableaux.

[21]Usually the adjacency is relativized to a particular tier (such as the vowel tier), but since this discussion abstracts over consonants, this point is irrelevant.

[22]This is equivalent to a situation where a recessive morpheme has two vowels of different heights.

constraint penalizes the maximally faithful candidate, which is the form that we expect. The other two candidates change the height of either of the vowels, satisfying Agree Hi and only incurring a violation of the lower-ranked ID-Hi. Reranking ID-Hi above Agree Hi would work in this case, but it makes the wrong prediction for the input /i - o [+Lo] [–Hi]/ in (196), where it would cause the impossible output *io* to be selected.

(197)

i - e	Dist-Faith-Fr *α	Max Fl [+Lo]	Max Fl [–Hi]	Agree Hi	Agree Lo	*o	*+Lo	ID-Lo	ID-Hi
a. ☹ ie				*!					
b. 💣 ee									*
c. 💣 ii									*

What if we used Spread constraints Padgett (1995)) instead? These are markedness constraints that are similar to Agree constraints, but militate against particular features being present in the output but not realized on every segment in it. We see in (200) that this also doesn't work, as the two selected outputs are the same as with Agree.[23]

(198) **Spread [+Lo]**: Assign a violation for each vowel that each [+Lo] segment in the output is not linked to.

(199) **Spread [–Hi]**: Assign a violation for each vowel that each [–Hi] segment in the output is not linked to.

(200)

i - e	Dist-Faith-Fr *α	Max Fl [+Lo]	Max Fl [–Hi]	Spread [+Lo]	Spread [–Hi]	*o	*+Lo	ID-Lo	ID-Hi
a. ☹ ie					*!				
b. ee$_1$					*!*				*
c. 💣 ee$_2$									*
d. 💣 ii									*

We could also try reranking Id-Hi above Spread, but as the tableau below shows, that won't work for the input /i - o [+Lo][–Hi]/. What we find then is a ranking contradiction:

[23]The difference between candidates (b) and (c) is that candidate (b) changes the Hi value of the first segment from + to -, whereas candidate (c) deletes the Hi feature of the first segments and spreads the –Hi feature from the second segment. Consequently, (b) gets two violations of Spread [–Hi] because it has two [–Hi] features, each of which is not linked to one segment, whereas (c) has only one [–Hi, which is linked to both of them.

ID-Hi needs to be above the harmony constraints to account for the dominant-recessive case, but below them to account for the recessive-recessive case.

(201)

i - o [+Lo] [–Hi]	Dist-Faith-Fr	*a	Max Fl [+Lo]	Max Fl [–Hi]	ID-Hi	Spread [+Lo]	Spread [–Hi]	*o	*+Lo	ID-Lo
a. 💣 io			*				*	*		
b. ☹ eo$_1$			*		*!		*	*		
c. ☹ eo$_2$			*		*!			*		
d. iu			*	*!	*					
e. au	*!				**	*	*		*	*
f. eu			*		*!*		*			

Going back to the input /i-e/ from (197) and (200), where the problem was that the harmony constraints were overharmonizing the vowels, instead of reranking ID-Hi, we could consider adding integrity to anchored features, which we use in the analysis I propose. This constraint would prevent spreading of features from one vowel to another, as it does in the candidates (b) and (d). However, candidate (c) evades this constraint by changing the [–Hi] to [–Hi], thereby rendering Spread [–Hi] inapplicable, at the expense of a violation of the lower-ranked ID-Hi. While ranking Max [–Hi] above the Spread constraints would solve this problem in (202), it makes an incorrect prediction for underlying /o/ (203), which is predicted to surface as *o* in a recessive environment.

(202)

i - e	Dist-Faith-Fr	*a	Int-Anch	Max Fl [+Lo]	Max Fl [–Hi]	Spread [+Lo]	Spread [–Hi]	*o	*+Lo	ID-Lo	ID-Hi
a. ☹ ie						*!					
b. ii$_1$			*!								*
c. 💣 ii$_2$											*
d. ee$_1$			*!								*
e. ee$_2$						*!*					*

(203)

o	Dist-Faith-Fr	*α	Int-Anch	Max Fl [+Lo]	Max Fl [–Hi]	Max [–Hi]	Spread [+Lo]	Spread [–Hi]	*o	*+Lo	ID-Lo	ID-Hi
a. u						*!						*
b. ☞ o									*			

I have shown so far that even if we find a constraint ranking that correctly maps single fully vowels onto licit outputs, once we get to combining morphemes we end up with ranking paradoxes. These ranking paradoxes have largely come from the behavior of the underlying mid vowels. Previously, we had underlying /e/ map onto surface *e* in recessive environments, as shown in (204). But this is not the only possibility. Since /a/ maps onto /e/ in recessive environments, we could try to have /e/ map onto *i* in the recessive set: instead of (204), we would have (205). With this ranking, /a/ still maps onto *e* in the recessive case (206), allowing us to derive the full vowel inventory.

(204)

e	*o	*+Lo	ID-Lo	ID-Hi
a. ☞ e				
b. i				*!
c. a		*!	*	

(205)

e	Dist-Faith	*α	Int-Anch	Max Fl [+Lo]	Max Fl [–Hi]	Spread [+Lo]	Spread [–Hi]	*o	*+Lo	*e	ID-Lo	ID-Hi
a. e										*!		
b. ☞ i												*
c. a									*!		*	

(206)

a	Dist-Faith	*α	Int-Anch	Max Fl [+Lo]	Max Fl [–Hi]	Spread [+Lo]	Spread [–Hi]	*o	*+Lo	*e	ID-Lo	ID-Hi
a. a									*!			
b. ☞ e										*	*	
c. i	*!										*	*

The problem is that this results in the dominant version of /e/ being *a*, predicting an unattested *i/a* harmony alternation.

(207)

e [+Lo] [–Hi]	Dist-Faith	*ɑ	Int-Anch	Max Fl [+Lo]	Max Fl [–Hi]	Spread [+Lo]	Spread [–Hi]	*o	*+Lo	*e	ID-Lo	ID-Hi
a. e				*!						*		
b. i				*!	*!							*
c. ☞ a									*		*	

In this discussion, I have assumed that the correct treatment of non-recessive morphemes in a full specification analysis is to endow them with the same sets of floating features that I have used in the underspecification analysis. The alternative to this would be to overspecify (some of?) the vowels of non-recessive morphemes so that they contain the features necessary for harmony [+Lo]. This is reminiscent of one of the solutions to a famous problem in Hungarian vowel harmony where certain words with front vowels trigger back rather than front harmony. According to a line of analysis proposed in Vago (1973, 1976), these words have underlying back unrounded vowels which are fronted by the surface phonology of the language. However, the rules of vowel harmony apply before this fronting, causing these front vowels to trigger back harmony. Along these lines, we could claim that, for example, the vowel of the root *ikm-* 'short', which triggers mixed harmony, is underlyingly [+Lo], and that some phonological process of Koryak raises it to *i* on the surface in the absence of a dominant morpheme. However, it's not clear why an underlyingly low vowel would be realized as high, given that realizing it as either low or mid would be more faithful to the underlying form. In fact, given that *a* patterns like a front vowel in Koryak, the *i* of *ikm-* would have to be specified identically to *a*. In Hungarian, by contrast, the back unrounded vowels are not surface vowels of the language, and can be mapped straightforwardly onto their front unrounded surface realization.

Ultimately, it seems that the main issue that an attempt to derive the harmony pattern from full specification consistently runs into is that there is no single feature being harmonized for. Recall the three classes of vowels: [i u e ə], [i u a ə], and [e o a ə]. Not only is there massive overlap across the classes of vowels, there is no single feature that unites any of the classes. Consequently, there is no markedness constraint that we can use to force the vowels to alternate the way that they are required to. This is unlike in the system that I propose, where the harmonic behavior comes from a combination of feature spreading and TETU, where vowels can only receive features that they are not specified for in the input. Consequently, my approach allows Koryak vowel harmony to be analyzed using feature spreading in a way that is reminiscent of other vowel harmony systems.

There is also a second, simpler, problem for approaches to this problem that do not rely on morpheme structure constraints face: the fact that [–Hi] can float (as it does on dominant morphemes) and we see alternations involving it, though not on its own. That is, there are no morphemes behaving like they have a floating [–Hi] and no other floating feature. Such a morpheme would be equally dominant as the mixed morphemes, but would

instead allow only [e], [o], and [ə]. It would cause the lowering of *i* and *u* in a recessive morpheme, but would not lower *e*. Additionally, when combined in a word with a mixed morpheme, they would together have the effect of a dominant morpheme, as they would together contribute both the [–Hi] and [+Lo] features of a dominant morpheme.

Since a rich base could provide us with a morpheme with just [–Hi], we need to find a way to obscure its effects. The only mechanism I know of would be to make spreading of [–Hi] parasitic on spreading [+Lo], which OT-CC (McCarthy 2007) and Optimal Interleaving (Wolf 2008)'s Prec constraints would do, by penalizing a derivation in which [–Hi] spread without [+Lo] spreading having occurred before this. While this should prevent the hypothetical morpheme from lowering a recessive morpheme's *i* and *u* in isolation (thereby causing it to behave like a recessive morpheme), it would not prevent this if a [+Lo] from a different morpheme spread first. We would then falsely predict a class of morphemes that behaves as dominant in the presence of a mixed morpheme, but recessive in the absence of one.

3.6 Discussion

In this and the previous chapter, I have argued that phonology needs to be able to target the underlying representations of Koryak in addition to the surface representations. This is not only because this gives simpler analyses of the Koryak facts, but also because using extant theoretical tools to attempt to account for the distribution and alternation patterns of the vowels and the segments *v* and *w* is not possible. This claim touches on a major debate in the history in phonology: is the underlying representation a licit derivational level for phonological operations to target? In earlier models of generative phonology (Halle 1959 et seq.), it was proposed that morpheme-level phonology be used as a way of minimizing the content of underlying representations. This was done by inserting predictable information using phonological rules ('morpheme structure rules', in Halle (1959)'s terminology,) rather than by including such information in the underlying representations. The distribution of *v* and *w* can be straightforwardly accounted for using the morpheme structure rule in (208), which states that any oral labial continuant is an obstruent. In this way, the underlying representations do not have to distinguish /w/ from /v/ in morpheme-final position.

(208) [+lab, +cont,-nas]→ [-son] / _#

However, the use of these rules was not without problems: Kenstowicz and Kisseberth (1977) point out a number of problems with morpheme-level phonological rules, the two most relevant ones for our purposes being the duplication problem and the domain problem.

Let's first consider the duplication problem, which refers to the fact that many morpheme structure rules simply end up replicating the effects of phonological rules that apply at later stages in the derivation. Consequently, Kenstowicz and Kisseberth argue that at least some morpheme structure rules should apply not to individual entries in the lexicon, but instead to polymorphemic strings that have potentially had other phonological rules apply to them. This creates an issue, however, if a principle of the grammar requires that morpheme structure rules be used to fill in all predictable information within morphemes, as duplication of the rules is in these cases is forced. Fortunately, the morpheme-level phonology propose in these two chapters does not suffer from this problem. First, only the problem concerning the labials discussed in the previous chapter is solved by something equivalent to the kind of morpheme structure rule Kenstowicz and Kisseberth discuss: that one involves filling in predictable information (the sonorancy of labial continuants in a particular position) at the morpheme level, though I model it with constraint interaction rather than a Halle-style rule. Additionally, the process that bans *w* from final position does not show itself anywhere else in the language. Much to the contrary, as we saw, it is *v* that is banned from final position on the surface. Consequently, positing morpheme-level phonology of this type does not result in a duplication problem. The morpheme-level phonology implicated in the discussion of vowel harmony also does not suffer from such a problem, though for a more fundamental reason. Unlike the requirement that morpheme-final labial continuants be non-sonorants, the function of the restrictions on vowel representations is to *remove* features from possible underlying representations, which will then be added to over the course of the derivation. This makes the phonological processes that I posit to account for vowel harmony distinct from the morpheme structure rules of earlier generative phonology, and prevents a duplication problem from arising.

The second problem that is relevant here is the domain problem: what is the domain that rules or constraints on underlying representations apply to? Kenstowicz and Kisseberth discuss the fact that many purported morpheme structure rules (that is, rules that serve to fill in features that don't contrast in particular environments) actually apply to various levels of representation, such as the syllable or the entire word. Responding to this, later approaches like Lexical Phonology (Kiparsky 1982) argued that relevant levels corresponded to lexical categories (noun, verb, etc.) rather than individual morphemes. Stratal Optimality Theory (Bermúdez-Otero 2008) holds that there are two levels, the stem level (which may be recursive) and the word level, at which different constraint rankings can apply. Standard Optimality Theory (Prince and Smolensky 1993) is the most restrictive, holding that phonology can only apply at the surface level. As I have argued extensively, none of these approaches will work for either of the problems that we are considering, which instead require the morphemes themselves to be targeted.

There is a sense in which the view of morpheme-level phonology proposed in these two

chapters is unlike others discussed in the literature. Whereas approaches that assumed morpheme structure rules like Halle (1959) conceived of morpheme-level phonology as a way of encoding only contrastive information in morphemes, and leaving predictable phonological material up to the rule component, the view that I have advanced here (specifically, with regards to vowel harmony) essentially uses morpheme-level phonology opportunistically: when it is necessary to the analysis, morpheme-level phonology is proposed, but not when it isn't necessary. This may seem overly permissive as a general principle, and further research will hopefully address less ad-hoc ways of determining whether morpheme-level phonology is necessary. I will note, however, that this approach is in the spirit of the Minimum Description Length approach to phonological learning discussed in Rasin and Katzir (2015, 2016), according to which the a learner will posit restrictions on inventories so long as it results in a more compact grammar.

3.7 Conclusion

In this chapter, I have presented an analysis of the vowel harmony system of Koryak involving underspecification the underlying vowels in lexical items, where harmony is triggered by floating features associated with entire morphemes. In order to derive this sort of lexicon for Koryak, I have provided a morpheme-level grammar, whose role is to force underspecification of vowels on any inputs that the rich base could provide. This is the same approach I used to account for the distribution of *v* and *w* in the previous chapter, where I argued for a reversal of the word-level ranking ID-Son » Lic-v / _V at the morpheme level. It is, however, not necessary to go diving into the minutia of barely-studied languages to find phenomena that are solvable with morpheme-level phonology. The Cairene Arabic problem in chapter 2 is easily describable using a morpheme structure rule lengthening root-final vowels. In Korean, morpheme-final clusters that are simplified in unaffixed forms reemerge under vowel-initial affixation. Crucially, the set of these reemerging clusters is a proper subset of the allowable clusters of Korean, which is analyzable using a phonological process banning certain types of clusters in morpheme-final position. And in Maori, which bans syllables with consonant codas, a limited set of consonants emerge following the root when the passive or gerund suffix is affixed (Kenstowicz and Kisseberth 1977). It is true that other approaches (such as McCarthy's Paradigm Occulation analysis of Cairene Arabic) are possible, but given that they fail to extend to the similar Koryak case, it is worth questioning whether it is even desirable to allow Paradigm Occultation in the grammar. That is, since it looks like morpheme-level phonology is required to account for at least some of the facts of natural-language phonology, it is necessary to critically compare analyses with morpheme-level phonology to ones without it. The fact that an analysis of a particular phenomenon goes through without positing morpheme-level phonology is

therefore not in and of itself an argument for it.

Chapter 4

Successive Cyclicity and Dependent Case

4.1 Introduction

Much of the generative syntactic work on case has centered around three types of analyses:

- Structural case (Vergnaud 1977; Chomsky 1981, 1993, 2000 etc.), whereby arguments in a clause receive case due to the position they are in with respect to elements of the extended verbal projection. For example, Chomsky (2000, 2001) proposes that the subject gets nominative case in English by being targeted for agreement with T as the structurally closest nominal to it.
- Configurational case (Yip et al. 1987; Marantz 1991; Baker 2015 etc.), whereby nominals receive case marking by being in sufficiently local configurations with each other. Marantz (1991), for example, argues that accusative is assigned to the internal argument of a transitive verb because it is the lower of two caseless nominals within IP.[1]
- Inherent case (Chomsky 1986; Nash 1996; Woolford 1997; Legate 2008 etc.), whereby nominals receive case marking by merging with (a projection) of a head that assigns them a particular θ-role. Legate (2008) proposes along these lines that ergative case is assigned to transitive subjects by virtue of their having merged into the specifier of an agentive v.

These three analyses are not necessarily at odds with each other, as Baker and Vinokurova (2010)'s mixed structural-configurational analysis of case marking in Sakha

[1] One notable difference between structural case analyses and most instantiations of configurational analyses of case is that the latter are not claimed to be theories of nominal licensing (though see Branan (to appear) and Fong (2020, 2021)), but merely of surface case marking, unlike the former, which are usually claimed to be theories of both case marking and nominal licensing.

shows.[2] However, considerable debate currently exists over the analysis of the facts of particular languages, as well as the correct analysis of ergative case crosslinguistically. For example, Baker and Bobaljik (2018) question whether there are any languages whose facts are better accounted for by inherent case theory than by dependent case theory, whereas Sheehan (2017) argues that inherent case theory manages to account for the entire variety of attested crosslinguistic variation while avoiding the theoretical problems found in competing theories.

Against this backdrop, I provide in this chapter new empirical support for the configurational account of ergative case and against both the structural and inherent accounts of it based on fieldwork data from Koryak. In this language, I argue, long-distance movement of an absolutive *wh*-expression causes nouns in higher case domains to bear case-marking they would otherwise not have. I analyze this by proposing that *wh*-moved nominals have the potential to trigger configurational case assignment at each step along their path of successive-cyclic movement (*pace* Poole 2016). I then show that a theory of configurational case assignment largely in line with Baker (2015)'s Dependent Case Theory is suitable for analyzing these facts. I argue that a satisfactory account of these facts is unique to configurational accounts of ergative and dative case, providing empirical support to configurational theories of case. In doing so, I also provide one of the few arguents for intermediate landing sites of successive-cyclic movement from the distribution of morphological case.

The structure of the chapter is as follows: in §4.2, I provide background information on dependent and inherent theories of ergative case, the successive-cyclic hypothesis, and the case and agreement facts of Koryak. In §4.3, I provide a variety of arguments based on Koryak data from non-movement contexts that motivate a dependent analysis of both ergative and some instances of dative case. In §4.4, I discuss the data motivating the proposal that movement can feed dependent case marking, for which I provide an analysis in §5.4. Section 4.6 discusses the position of the absolutive direct object and provides evidence that it moves out of the VP. In §4.7, I discuss various consequences of the analysis, including how the proposal allows us to make sense of an otherwise puzzling extraction restriction, and compare how other possible accounts of these facts fare.

4.2 Background

4.2.1 Inherent and Dependent Ergative

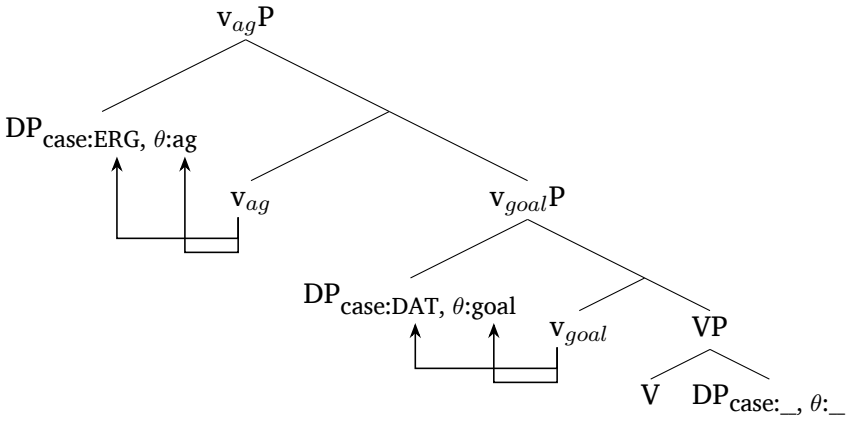
In this section, I will flesh out the properties of the inherent and configurational case analyses of ergative case. For inherent case. I will focus specifically on theory of Dependent Case introduced in Marantz (1991) and developed by other authors in subsequent works

[2]Though see Levin and Preminger (2015) for a configurational-only reanalysis of these facts.

(Baker and Vinokurova 2010; Baker 2014, 2015; Baker and Bobaljik 2018). As discussed in Baker (2015), structural accounts of case (in particular, case-by-agree) have well-known difficulties when it comes to accounting for ergativity, and have not featured significantly in recent discussions of ergative case (though see Rezac et al. 2014 and, arguably, Tyler 2020, for proposals along these lines) and I will therefore not address them in this chapter.

Inherent cases are assigned to a DP when it merges with (a projection of) a head that assigns a particular theta role. One implementation of this account was developed in a series of works by McGinnis (1996, 1998, 2002), whereby there are two inherent cases, dative and ergative, which are assigned by two different kinds of v, each associated with a theta-role assigned to its specifier: a lower one v_{goal}, which assigns dative case to a goal argument (corresponding to Appl in more recent work), and a higher one v_{ag}, which assigns ergative case to the agent.[3] This is sketched in (209).

(209)



Dependent case, on the other hand, is assigned to a caseless DP when it is sufficiently local to other caseless DPs by a process known as 'case competition.' According to Baker (2015), for example, the relevant locality domain is the phase, so case competitors must be close enough that no phase head separates them from each other.[4] Baker argues that accusative is assigned to the lower of two DPs within the complement of C, ergative is assigned to the higher of two DPs in the complement of C, and dative is assigned in the same configuration within VP/ApplP. In an accusative language, then, the interaction between the subject and object that gives rise to accusative case on the latter is schematized in (210a). In (210b) is represented how accusative and dative interact in such a system: the indirect object, being the higher of the two arguments in the domain of dependent dative, is assigned dative case, and then the direct object, as the lower of two caseless arguments

[3] As has been pointed out in subsequent work, external arguments seem to be associated with more theta-roles than simply 'agent.' I will abstract over this distinction as it does not affect the arguments I will make.

[4] This ignores the distinction in Baker's system between languages with a v that introduces a hard phase and a v that introduces a soft phase. This is meant to account for the fact that, in some languages (such as Sakha), only caseless internal arguments that clearly move out of the VP interact for dependent case with the subject, whereas in others (such as Cuzco Quechua and, as we will see, Koryak), all caseless internal arguments do.

in the domain of dependent accusative, is assigned that case. The same interactions in an ergative case system are schematized in (211).

(210) a. [$_{CP}$ C [$_{TP}$ S T [$_{vP}$ _ v [$_{VP}$ V DO$_{ACC}$]]]]
domain of ACC

b. [$_{CP}$ C [$_{TP}$ S T [$_{vP}$ _ [v [$_{VP}$ IO$_{DAT}$ [V DO$_{ACC}$]]]]]]
domain of ACC *domain of DAT*

(211) a. [$_{CP}$ C [$_{TP}$ S$_{ERG}$ T [$_{vP}$ _ v [$_{VP}$ V DO]]]]
domain of ERG

b. [$_{CP}$ C [$_{TP}$ S$_{ERG}$ T [$_{vP}$ _ [v [$_{VP}$ IO$_{DAT}$ [V DO]]]]]]
domain of ERG *domain of DAT*

Given that the inherent case account of ergative case requires only the presence of a v assigning an agentive theta role, it predicts that ergative case should be permitted on agentive intransitive subjects, as is found in languages such as Basque (Levin 1989) and Hindi (Mohanan 1994). On the other hand, the dependent account of ergative case predicts that the presence of ergative marking should be insensitive to the theta-role a noun is assigned, and only track whether or not a lower caseless noun in present in the same case domain. This has been argued to be instantiated by applicativized unaccusatives in Shipibo (Baker 2014), Ixil (Imanishi 2017), Inuktitut (Yuan 2018), and Nez Perce (Deal 2019), where the theme of an unaccusative verb is assigned ergative case by virtue of an applicativized noun being added to the structure. The primary evidence for whether ergative case should be analyzed as dependent or inherent therefore boils down to whether ergative case tracks the thematic role of the argument that bears it, or whether it tracks the presence of a structurally-lower absolutive noun phrase. As we will see in §4.3, in Koryak it is the latter that ergative marking depends on.

4.2.2 Successive Cyclicity

As has been known at least since Ross (1967), A'-movement can relate two syntactic positions arbitrarily far from each other, as shown by paradigms like (212).

(212) a. Who$_i$ did John see _$_i$?

b. Who$_i$ did Mary say that John saw _$_i$?

c. Who$_i$ did Bill hear that Mary said that John saw _$_i$?

However, as predicted by Chomsky (1977)'s Subjacency Condition, there has accumulated a significant amount of evidence that A'-movement does not merely involve the position at which the moved element in is externally merged and the position at which it is pronounced, but also the specifiers of all of the intervening phase heads between those

two positions.[5] If the C and v heads are the only phasal ones in the clausal spine, the movement path of the *wh*-word in (212c) is really as in (213).[6]

(213) [$_{CP}$ Who did Bill [$_{vP}$ _ hear [$_{CP}$ _ that Mary [$_{vP}$ _ said [$_{CP}$ _ that John [$_{vP}$ _ saw _]]]]]]?

The successive cyclicity of movement was first proposed as a way of capturing the island effects discovered in Ross (1967), but much clearer evidence of reflexes of moved elements along their movement paths has been uncovered since the original proposal. Perhaps the earliest evidence came from complementizer selection in modern Irish (McCloskey 1979 et. seq.), in which every clause between the place where A'-movement has begun and ends (inclusive) bears the complementizer *a*, glossed as PART (214a), which does not appear in clauses without it: as (214b) shows, clauses not along the path of A'-movement instead get the complementizer *goN*. Other evidence has come from Chamorro (Chung 1982), where all verbs along the path of *wh*-movement display *wh*-agreement (215), and Belfast English (Henry 1995), where all of the clauses along the path of A'-movement have T-to-C movement (216), among many others (Clements 1984; Torrego 1984; Georgopoulos 1985; Barss 1986; McDaniel 1989; Haïk 1990; Horvath 1997; Fox 1999; McCloskey 2001; Bruening 2006; Cozier 2006; Van Urk and Richards 2015; Korsah and Murphy 2016; Davis 2019).

(214) a. [$_{CP}$ [Aon bhliain déag]$_i$ is dóigh liom [$_{CP}$ a
eleven years PART+COP.PRS likely to.me PART
deireadh m'athair [$_{CP}$ a bhí sé _$_i$ nuair …]]]
say.PST.HAB my.father PART was he when
'It's eleven years old that I think that my father used to say that he was when…'
McCloskey (2003, ex. 11)

b. … [$_{CP}$ gur dóigh liom [$_{CP}$ go ndeireadh
goN+COP.PRS likely to.me *goN* say.PST.HAB
m'athair [$_{CP}$ go raibh sé aon bhliain déag nuair …]]]
my.father *goN* was he eleven years when
'…that I think that my father used to say that he was eleven years old when…'
(ibid. ex. 13)

(215) a. Hum allum si Maria [na ha-p anak si Juan i p atgun].
AGRassume Maria COMP AGR-spank Juan the child
'Maria assumes that Juan spanked the child.' Chung (1994, ex. 3)

b. Hayi$_i$ hinalomña si Maria [pum anak _$_i$ i p atgun]?
who WHassume Maria WHspank the child
'Who does Maria assume spanked the child?' (ibid. ex. 4)

[5]This is an anachronistic formulation, as the original one was stated in terms of bounding nodes.
[6]For simplicity I ignore the movement of the subject from [Spec,vP] to [Spec,TP].

(216) a. I wonder [$_{CP}$ what$_i$ did John think [$_{CP}$ would he get $\_i$.]] Henry (1995, p. 108)

b. [$_{CP}$ John thought [$_{CP}$ he would get a bicycle.]][7]

The phenomena providing evidence for the successive-cyclic hypothesis are diverse, including complementizer allomorphy (214), *wh*-agreement (215), head movement (216), stranding (McCloskey 2001; Davis 2019), resumption (Van Urk and Richards 2015), and scope reconstruction (Barss 1986; Fox 1999). Little data in favor of this hypothesis, however, have come the distribution of morphological case borne by nominals (though see É. Kiss 1987 and Levin 2017.)

Current Minimalist thinking takes phase edges to be the locations of the stop-off points of successive cyclic movement (Chomsky 2000, 2001). Consequently, overt evidence for successive-cyclicity is important for determining the location of phase heads. Based on the available evidence (including the data from reconstruction and pronominal copies discussed in the previous paragraph), the opinion in the literature has largely coalesced around C and v being phase heads (see van Urk (2019) for a recent survey), though there remains some skepticism about the phasehood of the latter (Keine 2016, 2017; Dayal 2017), and evidence for the phasehood of T in relative clauses has also been forthcoming (Deal 2016).

4.2.3 Koryak Case and Agreement

Case marking in Koryak follows an ergative pattern with no splits: transitive verbs that do not assign their complements a lexical case have their subject in the ergative case and their object in the absolutive case regardless of tense, aspect, mood, or finiteness, as in (217). Additionally, the language has free word order in many respects: non-quantificational nominals from the same clause may be in any position with respect to each other and the elements of the extended verbal projection without impacting the truth conditions of the sentence. For example, all six possible orders of the words in the sentence in (217a) are acceptable with the given meaning.

(217) a. ɣəm-nan t-ə-nu-ne-w ʔəvənʔ-u AOR
1SG-ERG 1SG.S/A-EP-eat-3.O-3PL berry-ABS.PL
'I ate berries.'[8]

b. ɣəm-nan t-ə-je-nu-ŋ-ne-w ʔəvənʔ-u FUT.PFV
1SG-ERG 1SG.S/A-EP-FUT-eat-FUT-3.O-3PL berry-ABS.PL
'I will eat berries.'

[7] Constructed based on the description.

[8] Aorist morphology is never overt on transitive verbs.

c. ɣəm-nan t-ə-je-nu-jk-ə-ne-w ʔəvənʔ-u FUT.IMPF
1SG-ERG 1SG.S/A-EP-FUT-eat-IPFV-3.O-3PL berry-ABS.PL
'I will be eating berries.'

d. ɣəm-nan m-ə-nu-ne-w ʔəvənʔ-u IMP.PFV
1SG-ERG 1SG.S/A.IMP-EP-eat-3.O-3PL berry-ABS.PL
'I should/must eat berries.'

e. ju-kkə ɣəm-nan əməŋ ʔəvənʔ-u, əllәʔ-a
eat-PST.CVB 1SG-ERG all berry-ABS.PL mother-ERG

∅-ena-kətʔajŋa-j PST.CVB
2/3.S/A.IND-1SG.O-scold-AOR
'After I ate all the berries, my mother scolded me.'[9]

Koryak has a large inventory of morphological cases, though only a limited number of them will be relevant to this chapter. The forms for three of the core cases and one lative case for the first person pronouns, a name, and an inanimate noun are given in Table 4.1, which illustrates some aspects of case and number marking that will become relevant. First, Koryak has a contrast between three numbers, singular, dual, and plural, and this contrast is realized overtly on all (pro)nominals in the absolutive case. Pronouns and high animate nouns (names and certain words referring to humans and animals) morphologically distinguish only singular from non-singular (i.e. dual and plural) in the non-absolutive cases, though the full three-way number contrast is reflected in verbal *phi*-agreement with non-absolutives. Inanimates do not show any number distinction outside of the absolutive. High animate nouns additionally have a stem extension (in blue) before the case suffix (in red) in non-absolutive cases which suppletes for both case and number.[10] Pronouns have a similar suffix, though it is not found in the ergative. These stem extensions are glossed as OBL, and cannot occur independent of a following case marker.[11] Single schwas between morphemes are epenthetic and have no morphosyntactic status.

Koryak is a pro-drop language: when the identity of arguments can be inferred from the context, they are often not expressed overtly. This includes both local person arguments (218a), where the presence of verbal morphology usually (though not always) uniquely specifies the interpretation of the verb's arguments, as well as third person arguments (218b), where contextual information is needed for this disambiguation. However, as the purpose of this chapter is to explain the distribution of morphological cases borne by

[9] Lit. 'I having eaten all of the berries...'

[10] I am grateful to an anonymous reviewer, whose comments led to a clarification of the role of the stem extension.

[11] The one exception to this is the ergative nonsingular on high animates, where no overt case suffix follows the oblique stem extension. This is likely only an apparent exception, however. The expected stem extension and case suffix combination for this slot is *-*jəkək*, which includes two heteromorphemic velars separated by a schwa. Such a sequence is generally dispreferred by the language's phonology, making it plausible that there is a case suffix following the oblique stem extension in all non-absolutive cases, which happens to subsequently be deleted by a (morpho)phonological process in the nonsingular ergative.

		‘I/we’	*ʔewŋəto-* ‘Hewngyto’	*wala* ‘knife’
ABS	SG	ɣəmmo	ʔewŋəto-∅	wala-∅
	DU	muj-i	ʔewŋəto-nte	wala-t
	PL	muj-u	ʔewŋəto-w	wala-w
ERG	SG	ɣəm-nan	ʔewŋəto-na-k	wala-ta
	NSG	mot͡ɕɣ-ə-nan	ʔewŋəto-jək-∅	
DAT	SG	ɣəm-k-ə-ŋ	ʔewŋəto-na-ŋ	wala-ŋ
	NSG	moj-k-ə-ŋ	ʔewŋəto-jək-ə-ŋ	
ABL	SG	ɣəm-ka-ŋqo	ʔəwŋəto-na-ŋqo	wala-ŋqo
	NSG	moj-ka-ŋqo	ʔewŋəto-jəka-ŋqo	

Table 4.1: A selection of Koryak case forms

nouns, most examples will be given with overt arguments.

(218) a. *pro*$_{1sg}$ t-ə-ja-pŋəlo-ə-la-ŋ-tək *pro*$_{2pl}$
1SG.ERG 1SG.S/A-EP-FUT-question-EP-PL-FUT-2NSG.S/O 2PL.ABS
‘I will ask you all a question.’

b. ʔoptəʎʔən it͡ɕt͡ɕet
entire war.party.ABS.SG

∅-ko-walelŋ-at-ə-ŋ-∅, miŋkəje
2/3.S/A.IND-PRS-spectate-VBLZ-EP-PRS-3.S.IND how

ŋəja-t͡ɕɣaj-ʎaŋ-a em-əɲɲeɲ-u-te na-ko-nm-ə-ŋ-na-w
four-COLL-OBL-ERG DSTR-one-DSTR-ADV INV-PRS-kill-EP-PRS-3.O-3PL

jəlq-ə-lʔ-u. “o-o-ok” – kətawut
sleep-EP-S/O.PTCP-ABS.PL o-o-ok suddenly

∅-kumŋ-ə-lqiv-i ŋəvat͡ɕ-ə-lʔ-ə-n,
2/3.S/A.IND-yell-EP-SMLF-AOR jolt.awake.at.night-EP-S/O.PTCP-EP-ABS.SG

jeqqe ŋanko *pro*$_{3pl}$ na-peɲŋ-ə-n *pro*$_{3sg}$, *pro*$_{3pl}$
but then 3PL.ERG INV-attack-EP-3(SG).O 3SG.ABS 3PL.ERG

ne-ku-piʎɣ-ə-t͡ɕvi-ŋ-ə-n *pro*$_{3sg}$
INV-PRS-throat-EP-cut-PRS-EP-3(SG).O 3SG.ABS
‘The entire war party watched how {the foursome}$_i$ killed the sleeping [enemies] one by one. ‘O-o-ok’, suddenly yelled out {one who jolted awake}$_j$, but then they$_i$ attacked him$_j$, they$_i$ cut his$_j$ throat (lit. throat-cut him$_j$).’ Kekketyn (2018a, 10.36-37)

As the examples above demonstrate, Koryak displays agreement with subjects and direct objects, and we will see below that it allows agreement in limited circumstances with indirect objects. The agreement morphemes in most TAM paradigms are both prefixal and

suffixal: some of them index subject agreement, such as the leftmost prefix in (218a), others index object agreement, such as the rightmost suffix in (218a), others can index either subject or object agreement, such as the omnivorous plural suffix *-la* in (218a) (the comparison of that example, where it indexes the plurality of the object, and (219a), where it indexes the plurality of the subject, show its omnivorousness,) and others index both the subject and object simultaneously, such as the suffix *-nin* in (219b), which occurs when the subject is 3rd singular and the object is 3rd person (Zhukova 1972; Dedyk 2014).

(219) a. *pro*$_{1pl}$ mətɕ͡-tɕ͡a-pŋəlo-la-ɣe *pro*$_{2sg}$
1PL.ERG 1NSG.S/A-FUT-question-PL-2SG.O 2SG.ABS
'We all will ask you a question.'

b. jaq-vet-ɣəjŋ-ə-n ewən
what-work-NMLZ-EP-ABS.SG must

n-ee-tejk-ik-ə-nin tɕ͡inin
2/3.S/A.COND-COND-do-IPFV-EP-3SG.A > 3.O self

jejɣutɕ͡ewŋ-ə-lʔ-e jaja-k?
study-EP-S/O.PTCP-ERG house-LOC
'What work must a student do on their own at home?' Vdovin and Jajletkan (1949, 19)

Agreement with the absolutive argument is required on finite verbs, though this morphology may be covert in certain TAM paradigms, like the 3rd person singular indicative prefix and suffix on the verb *kowalelŋatəŋ* 'watches' in (218b). If there is an ergative argument, finite verbs in all TAM paradigms other than the unwitnessed past agree additionally with it. This is exemplified by the contrast in (220): in (220a), the verb in the unwitnessed past only shows agreement with the 3rd singular direct object *jənnə=qi* 'what the heck', whereas the same verb in the witnessed past in (220b) shows both agreement with the 1st singular ergative subject pronoun and the 3rd singular direct object *qəʎevan* 'bread.' Converbs, like *jukkə* 'having eaten' in (217e) or *jəlqanma* 'while sleeping' in (221) show no *phi*-agreement, nor do infinitives, such as the verb *tɕ͡əvik* 'to cut' in the control complement in (222a), or *jətʔetək* 'to encounter' in the complement of the *tough*-predicate in (222b).

(220) a. jənnə=qi ɣəm-nan ɣa-jto-len-∅? -
what.ABS.SG=the.heck 1SG-ERG UW.PST-take.out-3.UW.PST-SG

ɣ-iw-lin-∅ jewjew
UW.PST-say-3.UW.PST-SG partridge.ABS.SG
"'What the heck did I give birth to?" said the partridge.' (Vdovin and Jajletkan 1949, 34)

b. ɣəm-nan t-eto-n oqqam-tɕ͡əko-ŋqo qəʎeva-n
1SG-ERG 1SG.S/A-take.out-3(SG).O box-IN-ABL bread-ABS.SG
'I took bread out of the box.' (Vdovin and Jajletkan 1949, 8)

(221) ɣəmmo jəlq-an-ma ənno ∅-kumŋ-at-i
1SG.ABS sleep-VBLZ-PRS.CVB 3SG.ABS 2/3.S/A.IND-yell-VBLZ-AOR
'While I was sleeping, he yelled.'

(222) a. ɣəm-nan t-ə-tawaŋ-na-w t͡ɕəvi-k əməŋ utt-u
1SG-ERG 1SG.S/A-EP-try-3.O-3PL cut-INF all tree-ABS.PL
'I tried to chop down all the trees.'

b. jemɣəmɣ-ə-ɣəjŋ-ə-n ta-ɣəjɲi-ŋ-ə-lʔ-a
fear-EP-NMLZ-EP-ABS.SG MAKE-beast-MAKE-EP-S/O.PTCP-ERG

jətʔ-et-ə-k ʔeɣ-ə-lŋ-ə-n təla-ma
encounter-VBLZ-EP-INF wolf-EP-SNGL-EP-ABS.SG walk-CVB.PRS

umk-ə-k
forest-EP-LOC
'It's scary for a hunter to encounter a wolf while walking in the woods.'

4.3 Dependent Case in Koryak

4.3.1 Koryak Ergative is Dependent

As discussed in previous section, the two theories of ergative case make different predictions concerning the syntactic environments in which ergative case arises. Specifically, dependent case theory predicts that ergative external arguments should only be found in the presence of caseless lower arguments, whereas inherent case theory makes no such prediction. I will show that both the static restrictions on Koryak verbs' case-frames, as well as a variety of case- and argument-structural-alternations found in the language, are consistent with the predictions of dependent case theory.

Koryak is not an active-stative language, as there is no split between unaccusatives and unergatives in the case-marking of intransitive subjects (223). Consequently, there are no verbs that take an ergative subject but no complement, as the inherent treatment of ergative would predict.[12]

[12]We know that *sing* in Koryak is unergative because it cannot form a passive participle using the circumfix *ɣe- -lin* (1a), unlike unaccusative (1b) and transitive verbs (1c), which can. The availability of passive participle formation in only a subclass of intransitive verbs is a crosslinguistically common diagnostic of unaccusativity (Williams 1981; Hoekstra 1984; Haspelmath 1994; Deal 2019).

(1) a. *ɣ-aŋaŋja-len ʔujemtewilʔ-ə-n
RES.PTCP-sing-3.RES.PTCP person-EP-ABS.SG
intended: 'a person that has sung'

b. ɣe-viʔ-ə-lin qoja-ŋa
RES.PTCP-die-EP-3.RES.PTCP reindeer-ABS.SG
'a reindeer that has died'

c. ɣa-nm-ə-len ʔeɣəlŋ-ə-n
RES.PTCP-kill-EP-3.RES.PTCP wolf-EP-ABS.SG
'a wolf that has been killed'

(223) a. {ʔojat͡ɕek / *ʔojat͡ɕek-a} ∅-aŋaŋja-j
{man.ABS.SG / *man-ERG} 2/3.S/A.IND-sing-AOR
'The man sang.'

b. {ʔətʔ-ə-n / *ʔətʔ-a} ∅-viʔ-i
{dog-EP-ABS.SG / *dog-ERG} 2/3.S/A.IND-die-AOR
'The dog died.'

Relatedly, some verbs assign their objects a lexical case, such as the narrative case in (224a) and the dative case in (224b). Crucially, both subjects are absolutive, as are the subjects of all verbs that have a non-absolutive object. In fact, although there are verbs that have more than one possible case-frame, like *peŋŋ-* 'attack' (225), and one of its diatheses allows each a lexical-case object (225a) and an ergative subject (225b), the two may not occur simultaneously (225c).[13]

(224) a. ɣəmmo t-ə-k-emŋol-ə-ŋ-∅ kəmiŋ-ə-kjit
1SG.ABS 1SG.S/A-EP-PRS-miss-EP-PRS-1SG.S child-EP-NARR
'I miss my son.'

b. qojalqot ∅-ko-ŋoʔ-ə-ŋ-∅ pet͡ɕɣ-ə-ŋ
Qojalqot.ABS.SG 2/3.S/A.IND-PRS-want.for-EP-PRS-3SG.S food-EP-DAT
'Qojalqot wants for food.'

(225) a. kajŋ-ə-n ∅-peŋŋ-e ʔəlva-ŋ
bear-EP-ABS.SG 2/3.S/A.IND-attack-AOR wild.reindeer-DAT
'The bear attacked the wild reindeer.'

b. kajŋ-a ∅-peŋŋ-ə-nen ʔəlve-ʔəl
bear-ERG 2/3.S/A.IND-attack-EP-3SG.A>3.O wild.reindeer-ABS.SG
'The bear attacked the wild reindeer.'

c. *kajŋ-a ∅-peŋŋ-ə-nen ʔəlva-ŋ
bear-ERG 2/3.S/A.IND-attack-EP-3SG.A>3.O wild.reindeer-DAT
intended: 'The bear attacked the wild reindeer.'

This is exactly what is predicted by the dependent account of ergative case, as ergative does not appear on a subject when the verb's complement is non-absolutive. Other verbal roots take different case frames depending on what verbalizer they combine with. In (226), we see the root *jimɣəmɣ-* with two possible verbalizers: the bound *-et* in (226a), and the light verb *-lŋ-* 'consider' in (226b). In the former, the internal argument is marked with a lexical case (allative)[14], barring the subject from being ergative, whereas it is absolutive in the latter, where the subject is required to be ergative.

[13]The sentence in (225a) is not an antipassive, which are marked by the prefix *ine-* and assign locative case to the internal argument of the verb, as shown in (231).

[14]For certain psych-predicates like *jimɣəmɣ-*, there is inter- and intra-speaker variation as to whether the internal argument gets allative or dative case. Speakers who accept both report no difference in meaning between the two, and there is no difference in the case-marking of the subject between that correlates with allative vs. dative object marking.

(226) a. ɣəmmo t-ə-ku-jimɣəmɣ-et-ə-ŋ-∅ ləqlaŋ-wəjal-etəŋ
1SG.ABS 1SG.S/A-EP-PRS-fear-VBLZ-EP-PRS-1SG.S winter-storm-ALL
'I am afraid of winter storms.'

b. ɣəm-nan jimɣəmɣ-u t-ə-ku-lŋ-ə-ŋ-ne-w
1SG-ERG fear-NFIN 1SG.S/A-EP-PRS-consider-EP-PRS-3.O-3PL.O

ləqleŋ-kin wəjal-o
winter-ADJ storm-ABS.PL
'I am afraid of winter storms.'

Note that object agreement in the examples above is only possible when the object is absolutive. For example, the verbs in (224) above are unacceptable if they show agreement with the lexically case-marked object (227).[15]

(227) a. *ɣəmmo t-ə-k-emŋol-ə-ŋ-ə-n-∅ kəmiŋ-ə-kjit
1SG.ABS 1SG.S/A-EP-PRS-miss-EP-PRS-EP-3.O-SG child-EP-NARR
intended: 'I miss my son.'

b. *qojalqot ∅-ko-ŋoʔ-ə-ŋ-nen
Qojalqot.ABS.SG 2/3.S/A.IND-PRS-want.for-EP-PRS-3SG.A > 3.O

pe͡tɕɣ-ə-ŋ
food-EP-DAT
intended: 'Qojalqot wants for food.'

Agentive ambitransitive verbs provide further evidence for the dependent nature of ergative case in Koryak. These are verbs that can either surface with a direct object or without one, and where the thematic properties of the subject are the same in both cases, such as English *eat*, *sew*, *dance*, and *sing*. In a language with dependent ergative case, we might expect these two uses of these verbs to correlate with different case marking on the subjects: if the non-pronunciation of the object is due either to the lexical verb not having a complement, or because whatever element is merged there is insufficiently referential to be a case competitor[16], we predict that ergative case should not occur on the subject of the objectless variant. The inherent account of ergative case makes no such prediction, and in fact on its own makes the opposite prediction, as the thematic properties of the subject do not depend on the presence of a direct object. Koryak has considerably fewer agentive ambitransitives than English[17], but the one such verb I have found, *kəlɣat-* 'harness', behaves as the dependent account of ergative predicts: the subject bears ergative case when the verb has an object (228a), but absolutive when it does not (228b). In the latter case, the theme cannot be overtly expressed regardless of the case it is marked with

[15]We will see below that a very limited number of dative-marked objects can trigger object agreement.

[16]See Baker (2015, ch. 5) for a proposal linking referentiality to the triggerring of dependent case.

[17]For example, the transitive and intransitive versions of *eat* and *sew* are expressed with distinct lexical items, and the verbs *dance* and *sing* are exclusively intransitive. To say 'sing a song' or 'dance a waltz', the verb *java-* 'use' is required.

(229): locative, which is found on the object of almost all antipassivized verbs, dative, which is found on the verbs whose case alternation is described above, and instrumental are all forbidden.[18]

(228) a. {ʔewŋəto-na-k / *ʔewŋəto}
{Hewngyto-OBL.SG-ERG / *Hewngyto.ABS.SG}

∅-ku-kəlɣ-aɲ-ŋ-ə-nin
2/3.S/A.IND-PRS-harness-VBLZ-PRS-EP-3SG.A > 3.O

ʔeja-qoja-w
sled.race-reindeer-ABS.PL
'Hewngyto is harnessing racing reindeer.'

b. {ʔewŋəto / *ʔewŋəto-na-k}
{Hewngyto.ABS.SG / *Hewngyto-OBL.SG-ERG}

∅-ku-kəlɣ-at-ə-ŋ-∅
2/3.S/A.IND-PRS-harness-VBLZ-EP-PRS-3.S.IND
'Hewngyto is harnessing.'

(229) *ʔewŋəto ∅-ku-kəlɣ-at-ə-ŋ-∅
Hewngyto.ABS.SG 2/3.S/A.IND-PRS-harness-VBLZ-EP-PRS-3.S.IND

{qoja-k / qoja-ŋ / qoja-ta}
{reindeer-LOC / reindeer-DAT / reindeer-INST}
intended: 'Hewngyto is harnessing reindeer.'

Embedded complement clauses in Koryak do not, as a general rule, trigger ergative case on the subject of the embedding verb, providing further evidence that ergative case on a subject is due to the presence of a lower absolutive nominal.[19]

[18]Reflexive ambitransitive verbs like *ilɣətev-* 'bathe' or 'wash (some)one's face' (depending on the speaker) also illustrate the same point: when they have a theme (meaning that the predicate is interpreted non-reflexively), the subject is marked ergative (1a), and when they do not, it is marked absolutive (1b).

(1) a. kaʌaʔaŋ-ə-na-k ∅-ilɣət-ew-nin ŋavakək
Kaljahang-EP-OBL.SG-ERG 2/3.S/A.IND-bathe-VBLZ-3SG.A > 3.O daughter.ABS.SG

elɣət-aw-ja-k
bathe-VBLZ-house-LOC
'Kaljahang bathed her daughter in the bathhouse.'

b. kaʌaʔaŋ ∅-ilɣət-ev-i elɣət-aw-ja-k
Kaljahang.ABS.SG 2/3.S/A.IND-bathe-VBLZ-AOR bathe-VBLZ-house-LOC
'Kaljahang bathed in the bathhouse.'

While the reflexive ambitransitive verbs provide evidence for the dependent account of ergative case, they don't provide as clear an argument against the inherent account because the theta roles are not identical in both variants. Agentive ambitransitive verbs, whose subjects are agents regardless of the verb's transitivity, do provide such an argument, as the case on the subject varies while its theta-role remains the same.

[19]Whether or not a verb takes an ergative subject with a complement clause depends on the choice of verb, and this seems to track whether or not the verb subcategorizes for an absolutive nominal complement when its complement is not clausal. For example, the verb *liɣi lŋ-* 'know'/'remember' is an example of a verb that

(230) a. kətawut tumɣ-ə-tum ∅-iv-i, əno
suddenly friend-EP-ABS.SG 2/3.S/A.IND-say-AOR that

omk-ə-t͡ɕ͡ɕəko-ŋqo ∅-t͡ɕ͡ɕepŋəto-j kajŋ-ə-n
forest-EP-IN-ABL 2/3.S/A.IND-appear-AOR bear-EP-ABS.SG
'Suddenly, the friend said that a bear had appeared from inside the forest.'
Vdovin and Jajletkan (1949, 211)

b. kali-k ɣət͡ɕt͡ɕi ɣa-kalit͡ɕit-iɣi, əno kanikul-ə-k
book-LOC 2SG.ABS UW.PST-write-2SG.UW.P that vacation-EP-LOC

tuj-u ∅-ja-jal-la-ŋ-tək
2NSG-ABS.PL 2/3.S/A.IND-FUT-come-PL-FUT-2NSG.S/O
'In the letter you wrote that you all would come [home] during the vacation.'
Vdovin and Jajletkan (1949, 21)

The evidence for the connection between ergative subjects and absolutive objects has so far come only from static restrictions on verbs' case-frames.[20] I will now show that

takes an ergative subject with a complement clause, and also subcategorizes for an absolutive complement when its complement is not clausal (1). I take this to indicate that the complement clauses are dominated by an additional nominal layer when they are the complement of a verb that subcategorizes for a nominal. Evidence for this comes from the fact that questioning the clausal complement of verbs that take an ergative subject with a clausal complement uses a nominal *wh*-word, as in (2a), to which (1a) was elicited as an answer, whereas questioning the clausal complement of a verb that takes an absolutive subject in such a circumstance requires an adverbial *wh*-word (2b).

(1) a. ɣəm-nan liɣi t-ə-ku-lŋ-ə-ŋ-ə-n-∅ əno ə-nan tətteʌ́
1SG-ERG know 1SG.S/A-EP-PRS-consider-EP-PRS-EP-3.O-SG that 3SG-ERG very

met?a-ŋ janot ∅-ko-jɣ-ə-ŋvo-ŋ-nen qoja-w
beautiful-ADV before 2/3.S/A.IND-PRS-lasso-EP-HAB-PRS-3SG.A>3.O reindeer-ABS.PL
'I remember that he was very good at lassoing reindeer.'

b. ɣəm-nan liɣi t-ə-ku-lŋ-ə-ŋ-ə-n-∅ aŋja-n
1SG-ERG know 1SG.S/A-EP-PRS-consider-EP-PRS-EP-3.O-SG answer-ABS.SG

woten-pəŋlo-n
PROX.DEM-question-POSS
'I remember the answer to this question.'

(2) a. jənnə ɣə-nan liɣi ∅-ku-lŋ-ə-ŋ-ə-n-∅ apappo-kjet?
what.ABS.SG 2SG-ERG know 2/3.S/A.IND-PRS-consider-EP-PRS-EP-3.O-SG grandfather-NARR
'What do you remember about your grandfather? '

b. jeqin ɣ-iw-lin-∅ eŋpít͡ɕ qaj-ə-kmiŋ-in, tite
how UW.PST-say-3.UW.PST-SG father.ABS.SG DIM-EP-boy-POSS when

ɣe-jɣulel-lin-∅ ə-nan, əno ənno ɣa-tva-len-∅ majovka-k?
UW.PST-find.out-3.UW.PST-SG 3SG-ERG that 3SG.ABS UW.PST-be-3.UW.PST-SG mayovka-LOC
'What did the boy's father say when he found that that [the boy] had been at a *mayovka*?' Vdovin and Jajletkan (1949, 231)

[20]Faruk Akkuş (p.c.) raises the issue of cognate objects of unergative verbs: in a language with dependent ergative case, we might expect an alternation between an absolutive subject when a cognate object is not present, and an ergative one when an object is present. However, as the contrast between the (a) and (b) sentences in (1) and (2) exemplify, cognate objects of unergative verbs are not licensed for any Koryak verb I am aware of.

the same facts can be observed in argument-structural alternations like antipassivization, reciprocalization, causativization, noun incorporation, and dative shift.[21]

The first relevant general pattern is that altering a verb so that it no longer has an absolutive-marked internal argument causes its subject to lose ergative case-marking. Such modifications include antipassivization, reciprocalization, and noun incorporation. The two sentences in (231) illustrate the antipassive alternation, in which a transitive verb is marked by the prefix *ine-* and its object is marked with an oblique case (almost always locative.) We see that when the verb is antipassivized, its subject goes from being marked with ergative case to absolutive case.

(231) a. ɣəm-nan t-ekmit-ə-n wala stoʎ-ə-ʎq-ə-ŋqo
1SG-ERG 1SG.S/A-take-EP-3SG.O knife.ABS.SG table-EP-SUP-EP-ABL
'I took a knife from the table.'

b. ɣəmmo t-in-ekmit-ə-k wala-k
1SG.ABS 1SG.S/A-AP-take-EP-1SG.S knife-LOC
'I took/armed myself with a knife.'

Another relevant argument structural alternation that is reciprocalization, a detransitivizing process that causes a verb to be interpreted as a reciprocal predicate. As shown by the sentence in (232b), it is marked with the suffix *-vəlŋ*, and also causes the verb's subject to lose ergative marking.

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(1) a. məl-aw-ɣəjŋ-ə-n
dance-VBLZ-NMLZ-EP-ABS.SG
'a dance'

b. ʔətʔəŋa ∅-ko-ml-av-ə-ŋ-∅
Hythynga.ABS.SG 2/3.S/A.IND-PRS-dance-VBLZ-EP-PRS-3.S.IND
'Hythynga is dancing.'

c. *ʔətʔəŋa-na-k ∅-ko-ml-aw-ŋ-ə-nen
Hythynga-OBL.SG-ERG 2/3.S/A.IND-PRS-dance-VBLZ-PRS-EP-3SG.A>3.O

melɣ-ə-taɲŋ-en məl-aw-ɣəjŋ-o
fire-EP-stranger-POSS dance-VBLZ-NMLZ-ABS.PL
intended: 'Hythynga is dancing Russian dances.'

(2) a. a͡tɕt͡ɕeqla-n
sneeze-ABS.SG
'a sneeze'

b. ɣəmmo t-a͡tɕt͡ɕeqla-k
1SG.ABS 1SG.S/A-sneeze-1SG.S
'I sneezed.'

c. *ɣəm-nan t-a͡tɕt͡ɕeqla-n-∅ n-ə-mejəŋ-qin a͡tɕt͡ɕeqla-n
1SG-ERG 1SG.S/A-sneeze-3.O-SG ADJ-EP-big-ADJ.SG sneeze-ABS.SG
intended: 'I sneezed a big sneeze.'

[21] A subset of these phenomena have been noted as arguments for a dependent case account of ergative and/or dative in the related languages Alutor (Podobryaev 2013) and Chukchi (Baker and Bobaljik 2018).

(232) a. mo͡tɕɣ-ə-nan mə͡tɕ-t͡ɕe-ləʔu-ŋ-ne-t uviki-t
1NSG-EP-ERG 1NSG.S/A-FUT-see-FUT-3.O-3DU self-ABS.DU
'We two will see {each other}/ourselves.'

b. muj-i mə͡tɕ-t͡ɕe-ləʔu-vəlŋ-ə-ŋ-∅
1NSG-ABS.DU 1NSG.S/A-FUT-see-RECIP-EP-FUT-1NSG.S/O
'We two will see each other.'

Finally, noun incorporation causes an internal argument of the verb to be realized within the verbal complex itself, as shown in (233b). Here, too, the case marking on the subject changes from ergative to absolutive when the object is no longer realized as an absolutive noun phrase.

(233) a. jejɣu͡tɕewŋəlʔ-ə-jək na-ko-jəlŋ-ə-ŋ-na-w kali-w
student-EP-OBL.NSG.ERG INV-PRS-read-EP-PRS-3.O-3PL book-ABS.PL
'The students are reading books.'

b. jejɣu͡tɕewŋəlʔ-u ∅-ko-kale-jəlŋ-al-la-ŋ-∅
student-ABS.PL 2/3.S/A.IND-PRS-book-read-VBLZ-PL-PRS-3.S.IND
'The students are reading books.'

In all three cases, these modifications result in the object no longer serving as a case competitor for the subject. In (231), this is due to the lexical status of the locative case; in (232), it is due to the reciprocal detransitivization of the verb *ləʔu-* 'see', such that it no longer selects for a complement; in (233b), this is either because the object is not sufficiently local to the subject to trigger dependent case on it, or because an incorporated nominal is not of the right size or category to serve as a case competitor (for example, an NP rather than a DP).

Valency-increasing processes like causativization have the opposite effect: causativizing an intransitive verb results in the causer getting ergative case and the causee staying absolutive. In (234a), the intransitive verb *ɣajmat-* 'want' has an absolutive subject. When this verb is causativized in (234b), the causee is still absolutive, and the causer is assigned ergative case.

(234) a. ənno ∅-ko-ɣajm-at-ə-ŋ-∅
3SG.ABS 2/3.S/A.IND-PRS-want-VBLZ-EP-PRS-3.S.IND

kale-jəlŋ-at-ə-k
book-read-VBLZ-EP-INF
'He wants to read books.'

b. ənno ɣə-nan ∅-j-ə-ɣajm-av-ə-n
3SG.ABS 2SG-ERG 2/3.S/A.IND-CAUS-want-VBLZ-EP-3SG.O

kale-jəlŋ-at-ə-k
book-read-VBLZ-EP-INF
'You made him want to read books.'

At first glance, this fact seems consistent with the inherent case account of ergative, as we can take the causative head to be a variety of v that assigns inherent ergative to its specifier. However, if a verb with no arguments, such as an unaccusative with an incorporated internal argument, is causativized, the causer gets absolutive case. This is illustrated in (235), where the causative prefix *j-* attaches to a constituent made of the verb *vi?-* 'die' and its incorporated internal argument *qoja-* 'reindeer'. The result of this is a causative with only the causer expressed as a full noun phrase, and this causer must be absolutive. The lack of ergative case on the causer is not because inanimate nouns are banned from being transitive subjects, as is known from Jacaltek or Halkomelem (Craig 1977; Gerdts 1988; Aissen 2003). This is demonstrated by the sentence in (236a), where the inanimate causer *kteɣ-* 'wind' is marked with ergative case. Indeed, with minimal changes the sentence in (235) is acceptable with an ergative subject, as long the verb bears transitive agreement and the object is interpreted as a raised possessor, as shown in (236b).[22]

(235) {təʔəl-ɣəjŋ-ə-n / *təʔəl-ɣəjŋ-a}
{sick-NMLZ-EP-ABS.SG / *sick-NMLZ-ERG}

∅-j-ə-qoja-veʔ-at-ə-tko-j
2/3.S/A.IND-CAUS-EP-reindeer-die-VBLZ-EP-PLRACT-AOR
'A disease caused reindeer to die.'

(236) a. kəteɣ-a ɣa-mal-ə-n-ɣə͡tɕɣol-aw-len-∅
wind-ERG UW.PST-quickly-EP-CAUS-high-VBLZ-3.UW.PST-SG

ʔew-nalɣ-ə-n
wolf-hide-EP-ABS.SG
'The wind quickly lifted up the wolf hide.' Stebnickij (1940, 15)

b. təʔəl-ɣəjŋ-a
sick-NMLZ-ERG

∅-j-ə-qoja-veʔ-at-ə-tko-nen *pro*$_{3pl}$
2/3.S/A.IND-CAUS-EP-reindeer-die-VBLZ-EP-PLRACT-3SG.A > 3.O 3PL.ABS
'A disease caused their reindeer to die.'

[22]Some speakers find animate absolutive causers degraded or unacceptable in comparison to inanimate ones, as the comparison between (1a) and (235) shows. One way to fix sentences like (1a) is to antipassivize the verb after causativizing it, as shown in (1b). I leave it to future work to understand why animacy should play a role in this corner (and, seemingly, only in this corner) of Koryak syntax.

(1) a. % ʔaqa-aŋaŋəlʔ-ə-n ∅-j-ə-qoja-tʔəl-aɲ-ŋəvo-j
bad-shaman-EP-ABS.SG 2/3.S/A.IND-CAUS-EP-reindeer-be.sick-VBLZ-INC-AOR
'The bad shaman made reindeer fall ill.'

b. ʔaqa-aŋaŋəlʔ-ə-n ∅-ena-n-qoja-tʔəl-aɲ-ŋəvo-j
bad-shaman-EP-ABS.SG 2/3.S/A.IND-AP-CAUS-EP-reindeer-be.sick-VBLZ-INC-AOR
'The bad shaman made reindeer fall ill.'

Finally, a valency decreasing process like noun incorporation can also feed a process that adds an absolutive argument to a verb like dative shift. The sentence in (237a) is a standard transitive clause with an ergative subject and an absolutive object. In (237b) an applied argument bearing inherent dative case is added, which does not change the case marking on either the subject or the object.[23] When the object is incorporated into the verb (237c), the subject loses its ergative case marking, but if the applied argument subsequently undergoes dative shift (237d), thereby being marked with absolutive case, the subject reappears as ergative. What these alternations show is that whether or not the subject gets ergative case tracks whether or not there is a lower absolutive argument.[24]

(237) a. ɣəm-nan t-ə-t͡ɕvi-n utt-ə-ut
1SG-ERG 1SG.S/A-EP-cut-3SG.O tree-EP-ABS.SG
'I chopped down a tree.'

b. ɣəm-nan t-ə-t͡ɕvi-n utt-ə-ut akəka-na-ŋ
1SG-ERG 1SG.S/A-EP-cut-3SG.O tree-EP-ABS.SG son-OBL.SG-DAT
'I chopped down a tree for my son.'

c. ɣəmmo t-utt-ə-t͡ɕvi-k akəka-na-ŋ
1SG.ABS 1SG.S/A-tree-EP-cut-1SG.S son-OBL.SG-DAT
'I chopped down a tree for my son.'

d. ɣəm-nan t-utt-ə-t͡ɕvi-n akək
1SG-ERG 1SG.S/A-tree-EP-cut-3SG.O son.ABS.SG
'I chopped down a tree for my son.'

The evidence presented above from argument structural alternations argues in favor of a dependent account of ergative case in Koryak rather than inherent case one, as the presence of ergative case on the subject seems to exactly track whether or not there is a lower argument with absolutive case. This complements the data concerning case-frame restrictions discussed previously, which came to the same conclusion.

[23]The status of the dative on the applied argument as inherent is discussed in §4.3.2.

[24]Unfortunately, the applied argument of an unaccusative (1a) cannot undergo dative shift whether the resulting internal argument bears absolutive or ergative (1b). Consequently, the arguments against inherent ergative drawn from raising to ergative in applicativized unaccusatives in Shipibo (Baker 2014) and Nez Perce (Deal 2019) cannot be recreated in Koryak.

(1) a. ogorod-ə-k ovoɕa-w ∅-ko-ɲŋa-la-ŋ-∅
garden-EP-LOC vegetable-ABS.PL 2/3.S/A.IND-PRS-grow-PL-PRS-3.S.IND

moj-k-ə-ŋ
1NSG-OBL-EP-DAT
'Vegetables are growing for us in the garden.'

b. *ogorod-ə-k {ovoɕa-w / ovoɕa-ta} na-ko-ɲŋa-la-mək
garden-EP-LOC {vegetable-ABS.PL / vegetable-ERG} INV-PRS-grow-PL-1NSG.S/O

muj-u
1NSG-ABS.PL
intended: 'Vegetables are growing for us in the garden.'

4.3.2 Some Instances of Dative in Koryak are Dependent

Having argued that all instances of ergative in Koryak represent dependent case, I will now defend a more limited claim about datives: some instances of dative case are the result of dependent case. The evidence for this comes from a split in the class of dative-marked nominals between ones that can trigger verbal ϕ-agreement and those that cannot: the former occur only in the presence of an absolutive-marked theme. I will call this the 'dative agreement generalization' (DAG). The effects of this generalization are exemplified in (238). In (238a), we find object agreement with the dative-marked second person pronoun, rather than the absolutive DP in object position. If there is no absolutive-marked theme (238b), the dative argument cannot be agreed with.

(238) a. t-ə-jəl-ɣi ɣən-k-ə-ŋ kewl-əpa-ŋa
1SG.S/A-EP-give-2SG.O 2SG-OBL-EP-DAT blood-soup-ABS.SG
'I gave you blood soup.'

b. {t-ə-t͡ɕejm-ev-ə-k / *t-ə-t͡ɕejm-ew-ɣi}
{1SG.S/A-EP-close-VBLZ-EP-1SG.S / 1SG.S/A-EP-close-VBLZ-2SG.O}
ɣən-k-ə-ŋ
2SG-OBL-EP-DAT
'I approached you.'

The behavior in (238a) is extremely restricted, and for most speakers is limited to the verb *jəl-* 'give'.[25] This means that not every verb with an absolutive theme and a dative goal can have that dative agreed with, as shown by the unacceptability of second person object agreement with the dative on the verb *tŋiv-* 'send' in (239a), as well as on the applicativized pronoun *tojkəŋ* 'to you all' in (239b).[26]

[25] One of my consultants also allows dative agreement with the verb *jəqeviv-* 'give as a gift'. Crucially, this verb also has an absolutive internal argument in addition to the agreed-with dative.

i. % qet͡ɕɣəlqot-ə-na-k ∅-ine-n-qevi-v-i ɣəm-k-ə-ŋ
Qechghylqot-EP-OBL.SG-ERG 2/3.S/A.IND-1SG.O-CAUS-gift-VBLZ-AOR 1SG-OBL-EP-DAT
nalɣ-ə-n
hide-EP-ABS.SG
'Qechghylqot gave me an animal hide as a gift.'

The highly restricted inventory of verbs that can target datives for agreement is a property of the Chukotkan language family as a whole: Mel'čuk (1988) reports that Alutor *jəl-* 'give as a wife' is the only verb that can agree with a dative goal, and the Chukchi verb *jɬ-* 'give' is the only one that Dunn (1999) cites as permitting object agreement with an allative goal (according to Dunn, unlike Koryak and Alutor, Chukchi does not have a dative case.) According to Bobaljik and Wurmbrand (2002), by contrast, the arguably distantly related Itelmen has much more widespread agreement with datives and other obliques.

[26] Note that the agreement possibilities remain unchanged if the dative-marked nominal and the absolutive-marked one switch linear positions.

(239) a. {t-ə-ɲŋiv-ə-n / *t-ə-ɲŋiw-ɣi}
{1SG.S/A-EP-send-EP-3SG.O / 1SG.S/A-EP-send-2SG.O}

ɣən-k-ə-ŋ akək
2SG-OBL-EP-DAT son.ABS.SG
'I sent my son to you.'

b. {t-ə-ko-p-aɲ-ŋ-ə-n /
{1SG.S/A-EP-PRS-boil-VBLZ-PRS-EP-3SG.O /

*t-ə-ko-p-al-la-ŋ-tək} kinuŋi
*1SG.S/A-EP-PRS-boil-VBLZ-PL-PRS-2NSG.S/O} meat.ABS.SG

toj-k-ə-ŋ
2NSG-OBL-EP-DAT
'I am boiling meat for you all.'

Some data involving the verb *iv-* 'say'/'tell', which can take a variety of case frames, initially look problematic for the generalization I proposed. Consider the sentences in (240). In (240a), we find an absolutive-marked agent and a dative-marked goal, and the verb is banned from agreeing with the goal, in line with the DAG. In (240b), we find an ergative-marked subject and an absolutive-marked goal, which trivially satisfies this generalization. The sentence in (240c), which is acceptable only to some speakers, is where the issue arises. Here, we have an agreed-with dative goal, but no absolutive theme, which the DAG requires. Notably, (240c) is sometimes translated into Russian with the clausal complement headed by a nominal like 'story' or 'news' (while (240a) is rejected on such a reading), suggesting that the embedded clause is part of a complex nominal triggering dative on the goal. Support for the complex nominal analysis of the embedded clause comes from the fact that the proposed nominal head can be overt, as in (241).

(240) a. ɣəmmo {t-iv-ə-k / *t-iw-ɣi}
1SG.ABS {1SG.S/A-tell-EP-1SG.S / *1SG.S/A-tell-2SG.O}

ɣən-k-ə-ŋ, əno qoja-wjep-ə-lʔ-o
2SG-OBL-EP-DAT that reindeer-herd-EP-S/O.PTCP-ABS.PL

∅-jal-la-j
2/3.S/A.IND-arrive-PL-AOR
'I told you that the reindeer herders arrived.'

b. ɣəm-nan t-iw-ɣi ɣə͡tɕ͡tɕi, əno
1SG-ERG 1SG.S/A-tell-2SG.O 2SG.ABS that

qoja-wjep-ə-lʔ-o ∅-jal-la-j
reindeer-herd-EP-S/O.PTCP-ABS.PL 2/3.S/A.IND-arrive-PL-AOR
'I told you that the reindeer herders arrived.'

c. % ɣəm-nan t-iw-ɣi ɣən-k-ə-ŋ, əno
1SG-ERG 1SG.S/A-tell-2SG.O 2SG-OBL-EP-DAT that

qoja-wjep-ə-lʔ-o ∅-jal-la-j
reindeer-herd-EP-S/O.PTCP-ABS.PL 2/3.S/A.IND-arrive-PL-AOR
'I told you the story/news/message that the reindeer herders arrived.'

(241) % ɣəm-nan t-iw-ɣi ɣən-k-ə-ŋ et͡ɕɣəp, əno
1SG-ERG 1SG.S/A-tell-2SG.O 2SG-OBL-EP-DAT news.ABS.SG that
qoja-wjep-ə-lʔ-o ∅-jal-la-j
reindeer-herd-EP-S/O.PTCP-ABS.PL 2/3.S/A.IND-arrive-PL-AOR
'I told you the news that the reindeer herders arrived.'

The hallmark of a dependent case is its reliance on the presence of a local caseless nominal. The data I have presented in this subsection shows that there is a split in the class of dative-marked nouns regarding whether or not they can control object agreement on the verb, and has further shown that the ones that can be agreed with have a local absolutive internal argument (though this is not sufficient for a dative-marked noun to be agreed with on its own, as (239a) and (239b) illustrate). That the split in the class of datives concerns their ability to trigger verbal agreement is not trivial: it has been known since Bobaljik (2008) that agreement is sensitive to the the case hierarchy proposed in Marantz (1991): if a language allows agreement with a nominal with one of the cases on the hierarchy *Unmarked* < *Dependent* < *Lexical/Oblique*, it also allows agreement with nominals with all of the cases to the left of that case on the hierarchy. Other than the limited class of datives discussed in this subsection, Koryak allows agreement with nouns bearing ergative, which I have already argued to be a dependent case, and absolutives, which is the unmarked case in an ergative language, but not with lexical case or oblique nouns. We therefore have evidence from two directions that the dative-marked nouns that can be agreed with have a dependent case. Koryak turns out to be a language like Nepali, where any noun with a dependent case (in Nepali, absolutive and ergative) can control verbal agreement under the right syntactic circumstances (Bickel and Yādava 2000). However, Koryak rounds out the crosslinguistic picture by allowing agreement with the full range of possible dependent cases.

4.3.3 Summary

In this section, I have provided evidence that Koryak has two dependent cases: ergative and dative. Ergative was argued to always be a dependent case based on a variety of arguments both from the static distribution of ergative subjects across the class of lexical verbs, as well as the distribution of ergative subjects in argument-structure alternations. Dative, I have argued, is instead a dependent case in only a limited number of circumstances, primarily involving the verb *jəl-* 'give'. The evidence for this came from the fact that only when a dative-marked noun occurred with an absolutive internal co-argument could it control

agreement, as is predicted if agreement can only target dependent and unmarked cases in Koryak.

4.4 Evidence from Movement

4.4.1 Introduction

In §4.3, I showed evidence from monoclausal environments for taking ergative to always be a dependent case, and for taking dative to be a dependent case in a limited set of circumstances. For the most part, these arguments are familiar from work on other languages in the dependent case literature, though Koryak may be unusual in terms of how many of these arguments can be advanced for it. In this section, I will present a novel argument for the dependent nature of ergative and (some) dative, coming from patterns of case assignment on nominals that *wh*-elements have moved across. In particular, I will show that an absolutive *wh*-word that has moved into or through one or more new case domains causes the case on otherwise-caseless noun phrases in that case domain to change. These new cases, I will argue, have exactly the properties of dependent cases discussed above. These unexpected dependent cases are triggered by the moving *wh*-word in positions other than its final landing site, providing a new kind of evidence for the hypothesis first proposed in Chomsky (1973) that *wh*-movement is successive-cyclic. I will first discuss movement out of an embedded finite clause, which causes ergative to appear on a matrix subject that would otherwise have absolutive. After that, I will consider movement from the non-finite complements of object control verbs, which causes dative marking on objects that would otherwise be absolutive.

4.4.2 Movement Triggering Ergative

Basic Data

Koryak is an overt wh-movement language: unless an island boundary intervenes, standard information-seeking questions have the *wh*-word at their left edge (242-243a). Consider the sentences in (242), which are the reading comprehension questions following a passage on the early history of flight in the textbook Vdovin and Jajletkan (1949, 144); these sentences have *wh*-words of various grammatical functions, all of which are at the left edge of the sentence. Speakers report that leaving a *wh*-word in situ causes the sentence to be interpreted as an echo-question (243b).

(242) a. jənnə jiŋe-lʔ-et-kin-∅
what.ABS.SG fly-S/O.PTCP-VBLZ-ADJ-SG

ɣa-n-toŋv-aw-len-∅ krjakutnoj-ə-na-k?
UW.PST-CAUS-be.created-VBLZ-3.UW.PST-SG Krjakutnoj-EP-OBL.SG-ERG
'What thing for flying did Krjakutnoj invent?'

b. jeqin ɣ-ew-ŋəvo-lena-w ʔujemtewilʔ-u, tite
how UW.PST-say-INC-3.UW.PST-3PL person-ABS.PL when

ət͡ɕɣ-ə-nan ɣe-jɣul-el-lin-∅, əno krjakutnoj
3NSG-EP-ERG UW.PST-learn-VBLZ-3.UW.PST-SG that Krjakutnoj.ABS.SG

ɣe-jiŋe-lin-∅?
UW.PST-fly-3.UW.PST-SG
'What did people say when they found out that Krjakutnoj had flown?'

c. miŋki etʔu ɣa-n-toŋv-aw-len-∅ jiŋe-kin-∅
where more UW.PST-CAUS-be.created-VBLZ-3.UW.PST-SG fly-ADJ-SG

kəmʔuk?
ball.ABS.SG
'Where else have they invented the hot-air balloon?'

d. jeq-e ∅-ko-n-kamlel-weje-w-ŋəvo-ŋ-nen
what-ERG 2/3.S/A.IND-PRS-CAUS-around-flow-VBLZ-HAB-PRS-3SG.A>3.O

propeʎʎer?
propeller.ABS.SG
'What rotates the propeller?'

e. jekkin-∅ samoʎot-ə-k ∅-ko-tva-ŋ-∅
why-SG airplane-EP-LOC 2/3.S/A.IND-PRS-be-PRS-3.S.IND

ləʔenaŋ?
rudder.ABS.SG
'Why is there a rudder on an airplane?'

(243) a. mikə-ne-k ɣət͡ɕt͡ɕi
who-OBL.SG-LOC 2SG.ABS

∅-ko-ja-ŋawtəŋ-ŋ-ə-ŋ-∅?
2/3.S/A.IND-PRS-DES-marry-DES-EP-PRS-3.S.IND
'Who do you want to marry?'

b. # ɣət͡ɕt͡ɕi ∅-ko-ja-ŋawtəŋ-ŋ-ə-ŋ-∅
2SG.ABS 2/3.S/A.IND-PRS-DES-marry-DES-EP-PRS-3.S.IND

mikə-ne-k?
who-OBL.SG-LOC
intended: 'Who do you want to marry?' (ok as: You want to marry WHO?)

Consider a sentence like (244), which features a matrix verb (*valom-* 'hear') that takes a finite clausal complement. The matrix subject is absolutive, which, following the diag-

nostics discussed previously, indicates that there is no lower absolutive argument in the matrix clause.

(244) ɣəmmo t-ə-valom-ə-k, əno ʔewŋəto-na-k
1SG.ABS 1SG.S/A-EP-hear-EP-1SG.S that Hewngyto-OBL.SG-ERG

∅-j-ə-t͡ɕim-aw-nin kojŋ-o
2/3.S/A.IND-CAUS-EP-break-VBLZ-3SG.A > 3.O cup-ABS.PL
'I heard that Hewngyto broke cups.'

However, consider what happens to the matrix clause when the embedded (absolutive) object *wh*-moves into the matrix clause (245), which speakers judge felicitous as part of a question-answer pair with (244): instead of being absolutive, the matrix subject is required to be ergative. Additionally, the matrix verb gets object agreement marking consistent with the ϕ-features of the moved *wh*-word, as (246), which differs from (244) only in having a dual, rather than a plural, *wh*-word, further supports.

(245) jej-u$_i$ {ɣə-nan / *ɣət͡ɕt͡ɕi} ∅-valom-na-w, əno
what-ABS.PL {2SG-ERG / *2SG.ABS} 2/3.S/A.IND-hear-3.O-3PL that

ʔewŋəto-na-k ∅-j-ə-t͡ɕim-aw-nin t_i
Hewngyto-OBL.SG-ERG 2/3.S/A.IND-CAUS-EP-break-VBLZ-3SG.A > 3.O
'What all did you hear that Hewngyto broke?'

(246) a. jej-i$_i$ {ɣə-nan / *ɣət͡ɕt͡ɕi} ∅-valom-na-t,
what-ABS.DU {2SG-ERG / *2SG.ABS} 2/3.S/A.IND-hear-3.O-3DU

əno ʔewŋəto-na-k
that Hewngyto-OBL.SG-ERG

∅-j-ə-t͡ɕim-aw-nin t_i
2/3.S/A.IND-CAUS-EP-break-VBLZ-3SG.A > 3.O
'What two things did you hear that Hewngyto broke?'

b. ɣəmmo t-ə-valom-ə-k, əno ʔewŋəto-na-k
1SG.ABS 1SG.S/A-EP-hear-EP-1SG.S that Hewngyto-OBL.SG-ERG

∅-j-ə-t͡ɕim-aw-nin kojŋ-ə-t
2/3.S/A.IND-CAUS-EP-break-VBLZ-3SG.A > 3.O cup-EP-ABS.DU
'I heard that Hewngyto broke two cups.'

I will argue that the obligatory ergative on the matrix subject in the *wh*-movement sentences is due to the moved absolutive *wh*-word triggering ergative by case competition in the matrix clause (in addition to the embedded clause.) This argument has two premises: first, that these sentences indeed instantiate long-distance (rather than local) *wh*-movement, and second, that the trigger of case competition is the moved *wh*-word, rather than something in the matrix clause. I will consider these premises and the arguments against them in turn.

Against a Local *Wh*-Movement Analysis

The first premise that my proposal is based on is that the *wh*-word moves from the embedded clause in (245) and (246a), rather than from the matrix clause.[27] The alternative would be that (245) and (246a) actually local *wh*-movement of a proleptic argument, such that a more accurate translation of (245) would be *What all did you hear about, such that Hewngyto broke them?*, as schematized in (247).[28] This alternative accounts for the case alternation because it takes the *wh*-word to be an argument of the matrix verb, making it unsurprising that the subject must be ergative.

(247) jej-u$_i$ {ɣə-nan / *ɣətɕ͡tɕ͡i} ∅-valom-na-w t_i,
what-ABS.PL {2SG-ERG / *2SG.ABS} 2/3.S/A.IND-hear-3.O-3PL

əno ʔewŋəto-na-k ∅-j-ə-tɕ͡im-aw-nin
that Hewngyto-OBL.SG-ERG 2/3.S/A.IND-CAUS-EP-break-VBLZ-3SG.A>3.O

pro$_{3pl}$

'What all did you hear about, such that Hewngyto broke them?'

Three arguments speak against such an analysis. First, although it is true that the verb *valom-* 'hear' can take an adjunct translated into English as an *about*-phrase, that adjunct must be marked with narrative (248a, 249a) rather than absolutive (248b,249b) case, regardless of whether there is a coreferential element in an embedded clause (248) or not (249). A felicitous example of *valom-* with an absolutive object and an embedded clause is provided in (250), showing that the absolutive object is interpreted as a source (a similar example is given in fn. 29) Since the alternative analysis requires the *wh*-word to be an argument of the matrix verb, it predicts that the *wh*-word be required to bear narrative case in order to get the right interpretation, which the previous examples show to be incorrect.

(248) a. ɣəmmo t-ə-valom-ə-k
1SG.ABS 1SG.S/A-EP-hear-EP-1SG.S

ʎeningrad-taŋŋ-ə-tɕ͡et-∅-ə-kjet
Leningrad-stranger-EP-RECIP.VBLZ-NMLZ-EP-NARR
'I heard about the Siege of Leningrad.'

[27] I thank Mikhail Knyazev and two anonymous reviewers for their discussion of this point, which significantly improved this part of the argument.

[28] Another possibility would be that this sentence instantiates partial wh-movement, where the matrix *wh*-word originates in the matrix clause and serves to disambiguate the scope of a *wh*-word found an embedded clause (Riemsdijk 1982 et. seq.), as in the German sentence in (1).

(1) was glaubt Hans [mit wem]$_i$ Jakob jetzt t_i spricht?
what thinks Hans with whom Jakob now talks
'With whom does Hans think that Jakob is now talking?'

However, the fact that no *wh*-word appears in the embedded clause and that complex *wh*-phrases can be moved long-distance (as in 251b) make a partial *wh*-movement analysis of the Koryak facts infeasible.

b. ɣəm-nan t-ə-valom-ə-n
1SG-ERG 1SG.S/A-EP-hear-EP-3(SG).O

ʎeningrad-taɲŋ-ə-t͡ɕet-∅
Leningrad-stranger-EP-RECIP.VBLZ-NMLZ.ABS.SG
'I heard (the sounds of) the Siege of Leningrad. / * I heard about the Siege of Leningrad.'

(249) a. tuj-mejŋ-ə-t͡ɕʔ-ə-kjit *pro*$_{1sg}$ t-ə-valom-ə-k,
new-big-EP-NMLZ-EP-NARR 1SG.ABS 1SG.S/A-EP-hear-EP-1SG.S

ə-nin ŋewʔen ∅-ko-vet-at-ə-ŋ-∅
3SG-POSS wife.ABS.SG 2/3.S/A.IND-PRS-work-VBLZ-EP-PRS-3.S.IND

ine-n-meʎ-ev-ə-t͡ɕʔ-u
AP-CAUS-good-VBLZ-EP-S/O.PTCP-EQU
'I heard about the new boss that his wife works as a doctor.'

b. # *pro*$_{1sg}$ t-ə-valom-ə-n tuj-mejŋ-ə-t͡ɕʔ-ə-n,
1SG.ERG 1SG.S/A-EP-hear-EP-3(SG).O new-big-EP-NMLZ-EP-ABS.SG

ə-nin ŋewʔen ∅-ko-vet-at-ə-ŋ-∅
3SG-POSS wife.ABS.SG 2/3.S/A.IND-PRS-work-VBLZ-EP-PRS-3.S.IND

ine-n-meʎ-ev-ə-t͡ɕʔ-u
AP-CAUS-good-VBLZ-EP-S/O.PTCP-EQU
intended: 'I heard about the new boss that his wife works as a doctor.'

(250) *pro*$_{1sg}$ t-ə-valom-ə-n tuj-mejŋ-ə-t͡ɕʔ-ə-n,
1SG.ERG 1SG.S/A-EP-hear-EP-3(SG).O new-big-EP-NMLZ-EP-ABS.SG

ʔoptəməŋ muj-u mət͡ɕ-t͡ɕa-vet-al-la-ŋ-∅
all 1NSG-ABS.PL 1NSG.S/A-FUT-work-VBLZ-PL-FUT-1NSG.S/O

qolen-paŋawje-ʔəlwəje-k
next-rest-day-LOC
'I heard (from) the new boss that we will all work next weeked.'

Additionally, the prolepsis analysis posits that the object of the embedded verb is not a *wh*-trace but a pronoun. As Koryak is a language that allows extensive *pro*-drop, the fact that no overt pronoun is present in the sentences in (245) and (246a) is not an issue for it. What is problematic about this analysis is that it predicts that the position that I argue contains a *wh*-trace in the embedded clause should be able to host an overt pronoun or demonstrative, not just as the *pro* schematized in (247). This is because Koryak does not ban overt pronominals in any syntactic environment I am aware of, and, additionally, the sentence in (249a), which seems to actually instantiate a prolepsis structure, has the possessive pronoun *ənin* in the embedded clause picking up the reference of the proleptic argument. The unacceptability of the sentence in (251a), which differs from (245) only in having an overt 3rd person absolutive pronoun as the object of the embedded verb,

counterexemplifies this prediction: the presence of the 3rd person plural pronoun *ət͡ɕt͡ɕu* makes the sentence unacceptable. Likewise, the fact that the addition of either the 3rd person singular pronoun *ənno* or the singular distal demonstrative *ŋajen* to the similarly-structured sentence in (251b) renders it unacceptable also provides evidence against a prolepsis analysis.

(251) a. *jej-u ɣə-nan ∅-valom-na-w, əno
what-ABS.PL 2SG-ERG 2/3.S/A.IND-hear-3.O-3PL that

ʔewŋəto-na-k ∅-j-ə-t͡ɕim-aw-nin
Hewngyto-OBL.SG-ERG 2/3.S/A.IND-CAUS-EP-break-VBLZ-3SG.A>3.O

ət͡ɕt͡ɕ-u
3NSG-ABS.PL
intended: 'What all did you hear about, such that Hewngyto broke them?'

b. jaq-kali-kal inenɣəjuʎev-ə-t͡ɕʔ-e ∅-valom-nen əno
what-book-ABS.SG teacher-EP-A.PTCP?-ERG hear-3SG.A>3.O that

ɣəm-nan t-ə-tulʔ-et-ə-n (*{ənno /
1SG-ERG 1SG.S/A-EP-steal-VBLZ-EP-3(SG).O (*{3SG.ABS /

ŋajen})
DIST.DEM.ABS.SG})
'What book did the teacher hear that I stole?'

A third argument against the prolepsis analysis is that it predicts that case mismatches between the *wh*-word and the empty category in the embedded clause should be tolerated. This is because the proleptic argument, as an argument only of the matrix clause, and the empty category in the embedded clause (*pro*, on this analysis), are not derivationally related on this analysis. Consequently, a *wh*-word marked with absolutive case (the case of the proleptic argument on this analysis) should be able to correspond to a non-absolutive in the embedded clause. In contrast, the crossclausal *wh*-movement analysis makes the opposite prediction: a mismatch between the case assigned to the *wh*-word and the case assigned to the gap should result in unacceptability. As the sentences in (252) show, case mismatches are not permitted, which cannot be accounted for on the prolepsis analysis. In (252a) (repeated from (224b) above), we see that the verb *ŋoʔ-* 'want for' takes a dative complement. When we attempt to form a long-distance question by putting an absolutive *wh*-word in the matrix clause, this leads to unacceptability. Likewise, in (253) we attempt to form a *wh*-question with an absolutive *wh*-word in the matrix clause that is associated with a transitive subject, which is marked with ergative case. This also leads to unacceptability.

(252) a. qojalqot ∅-ko-ŋoʔ-ə-ŋ-∅ pet͡ɕɣ-ə-ŋ
Qojalqot.ABS.SG 2/3.S/A.IND-PRS-want.for-EP-PRS-3SG.S food-EP-DAT
'Qojalqot wants for food.'

b. *jənnə ʔewjava-na-k ∅-valom-nen,
what.ABS.SG Hewjava-OBL.SG-ERG 2/3.S/A.IND-hear-3SG.A > 3.O

ɣəmmo t-ə-ko-ŋoʔ-ə-ŋ?
1SG.ABS 1SG.S/A-EP-PRS-want.for-EP-PRS-1SG.S
intended: 'What did Hewjava hear that I want for?'

(253) *jənnə meʌʌo-na-k ∅-valom-nen,
what.ABS.SG Melljo-OBL.SG-ERG 2/3.S/A.IND-hear-3SG.A > 3.O

∅-jəɣu-nin ɣə-nin ʔətʔ-ə-n?
2/3.S/A.IND-bite-3SG.A > 3.O 2SG-POSS.SG dog-EP-ABS.SG
intended: 'What did Melljo hear bit your dog?'

These three arguments provide evidence from both the matrix and the embedded clause against a prolepsis analysis of the sentences in question: neither the case-marking in the matrix clause, the pronunciation options for the embedded object, nor the case matching requirement between the *wh*-word and the embedded empty category suggest that we are dealing with a prolepsis construction. Based on this, I conclude that these sentences in fact instantiate long-distance *wh*-movement.

The Trigger is the Moving Absolutive

The second premise, that the trigger of ergative case on the matrix subject in the long-distance *wh*-movement sentences is in fact the moved *wh*-word, is also worth looking into closely, especially given the fact that the verb *valom-* can take an absolutive object and an ergative subject in the absence of long-distance *wh*-movement, as in (254), where an embedded clause is an adjunct modifying the noun phrase *et͡ɕɣəp-* 'news.'

(254) ɣəm-nan t-ə-valom-ə-n et͡ɕɣəp əno
1SG-ERG 1SG.S/A-EP-hear-EP-3SG.O news.ABS.SG that

ʔewŋəto-na-k ∅-j-ə-t͡ɕim-aw-nin
Hewngyto-OBL.SG-ERG 2/3.S/A.IND-CAUS-EP-break-VBLZ-3SG.A > 3.O

ŋət͡ɕt͡ɕeq kojŋ-ə-t
two cup-EP-ABS.DU
'I heard the news that Hewngyto broke two cups.'

The argument against the second premise is further strengthened by the fact that some speakers accept sentences like (240c), repeated below as (255), which, as I argued, feature an unpronounced internal argument triggering case competition. It's possible, then, that sentences like (245) and (246a) have a silent nominal projected above the embedded CP that triggers ergative case on the subject.

(255) % ɣəm-nan t-iw-ɣi ɣən-k-ə-ŋ, əno
1SG-ERG 1SG.S/A-tell-2SG.O 2SG-OBL-EP-DAT that

qoja-wjep-ə-l?-o ∅-jal-la-j
reindeer-herd-EP-S/O.PTCP-ABS.PL 2/3.S/A.IND-arrive-PL-AOR
'I told you the story/news/message that the reindeer herders arrived.'

Now, positing that sentences like (245) and (246a) have a covert nominal in object position that is triggering dependent ergative on the subject is a strange move to make: given that the equivalent sentences without *wh*-movement, (244) and (246b), are perfectly acceptable without ergative marking on the subject, this analysis of (245) and (246a) means that the covert nominal is only forced to appear when long-distance *wh*-movement has taken place. Even if we were to accept this, however, there is even stronger evidence against the ergative on the subject being due to a covert nominal in the matrix clause: just as in English, clausal complements to noun phrases like *(the news) that Hewngyto broke two cups* are islands in Koryak, as shown by the unacceptability of (256). It is therefore not possible to claim that the sentences where a clause with *valom-* has had an absolutive *wh*-word move into it, forcing the subject to be ergative, involve an obligatory covert noun in object position.[29]

(256) *jənnə$_i$ ɣə-nan ∅-valom-ə-n et͡ɕɣəp, əno
what.ABS.SG 2SG-ERG 2/3.S/A.IND-hear-EP-3SG.O news.ABS.SG that

?ewŋəto-na-k ∅-tul?-en-nin t_i?
Hewngyto-OBL.SG-ERG 2/3.S/A.IND-steal-VBLZ-3SG.A>3.O
intended: 'What$_i$ did you hear the news that Hewngyto stole t_i?'

Another possible way of rejecting the proposal that the obligatory ergative subject in (245) and (246a) is due to the movement of the embedded absolutive *wh*-word into the matrix clause is by tying it to the status of these sentences as questions. On this view, the fact that the left periphery of this clause has an interrogative C would be enough to force the matrix subject to bear ergative case. Such a proposal would be falsified by data

[29] In addition to allowing an absolutive theme, *valom-* also allows an absolutive source (i). I do not have data that shows whether this construction allows extraction out of the embedded clause, though we might expect it not to, since it looks rather like the equivalent of English constructions like *believe X that Y*, which do not allow extraction from Y (cf. **Who$_i$ do you believe Mary that John saw t_i?*)

i. ɣəm-nan t-ə-valom-ə-n kəjaw əno ?ewŋəto-na-k
1SG-ERG 1SG.S/A-EP-hear-EP-3SG.O Kyjaw.ABS.SG that Hewngyto-OBL.SG-ERG

∅-omma͡tɕajp-ə-nen meʎʎo
2/3.S/A.IND-hug-EP-3SG.A>3.O Melljo.ABS.SG
'I heard (from) Kyjaw that Hewngyto hugged Melljo.'

In principle, it could be that sentences like (245) and (246a) obligatorily have an absolutive *source* triggering ergative on the subject. I do not have an explicit argument against this proposal, but note that someone arguing for it would be faced with the unenviable task of trying to explain what the relationship between long-distance *wh*-movement and the presence of a source is.

showing that questions where the *wh*-word does not move into the matrix clause allow the subject to be absolutive, such as the sentences in (257): in (257b), the *wh*-word only undergoes partial *wh*-movement to the [Spec,vP] of the embedded clause, and in the echo question in (257c), the *wh*-word stays in its base position. These sentences show that the obligatory ergative subjects seen above cannot be attributed simply to a requirement of clauses containing a question operator, but must be tied to the presence of the moved *wh*-word in the higher clause.[30]

(257) a. meki ∅-valom-e, əno ʔewŋəto-na-k
who.ABS.SG 2/3.S/A.IND-hear-AOR that Hewngyto-OBL.SG-ERG

ɣa-ɲ-t͡ɕim-aw-lina-w ŋajej-o kojŋ-o?
UW.PST-CAUS-break-VBLZ-3.UW.PST-3PL that-ABS.PL cup-ABS.PL
'Who heard that Hewngyto broke those cups?'

b. ɣət͡ɕt͡ɕi ∅-valom-e əno ʔewŋəto-na-k
2SG.ABS 2/3.S/A.IND-hear-AOR that Hewngyto-OBL.SG-ERG

jej-u ɣa-ɲ-t͡ɕim-aw-lina-w t_i?
what-ABS.PL UW.PST-CAUS-break-VBLZ-3.UW.PST-3PL
'What all did you hear that Hewngyto broke?'

c. ɣət͡ɕt͡ɕi ∅-valom-e əno ʔewŋəto-na-k
2SG.ABS 2/3.S/A.IND-hear-AOR that Hewngyto-OBL.SG-ERG

ɣa-ɲ-t͡ɕim-aw-lina-w jej-u?
UW.PST-CAUS-break-VBLZ-3.UW.PST-3PL what-ABS.PL
'You heard that Hewngyto broke WHAT ALL?'

In order to confirm that the change in case on the matrix subject is due to the fact that the moving element is an absolutive nominal, rather than simply any element moving out of an embedded clause, we might like to see evidence that non-absolutives moving out of embedded clauses do not trigger a case change on the matrix subject.[31] Unfortunately, extraction from a finite clause is limited to absolutives: extraction of a non-absolutive results in unacceptability regardless of the case effects. This is exemplified in (258) for datives. We will see in the next subsection, however, that non-absolutives are extractable out of infinitives, and there, as predicted by the dependent case analysis, they do not trigger case effects.

(258) a. *mek-na-ŋ$_i$ ɣət͡ɕt͡ɕi ∅-valom-e əno
who-OBL.SG-DAT 2SG.ABS 2/3.S/A.IND-hear-AOR that

[30]The sentence in (257b) also shows that covert movement does not force the matrix subject to be ergative, which follows from the fact that dependent case is a PF, rather than an LF, phenomenon.

[31]See §4.7.2 for a sketch of an account (based on Rackowski and Richards (2005)) on which anything, not just an absolutive, moving out of a lower clause might be expected to trigger case competition on the subject.

ʔewŋəto-na-k ∅-jəl-nin urvaq t_i
Hewngyto-OBL.SG-ERG 2/3.S/A.IND-give-3SG.A>3.O shirt.ABS.SG
intended: 'Who did you hear that Hewngyto gave a shirt to?'

b. *mek-na-ŋ$_i$ ɣə-nan ∅-valom-ə-n əno
who-EP-OBL.SG-DAT 2SG-ERG hear-EP-3(SG).O that

ʔewŋəto-na-k ∅-jəl-nin urvaq t_i
Hewngyto-OBL.SG-ERG 2/3.S/A.IND-give-3SG.A>3.O shirt.ABS.SG
intended: 'Who did you hear that Hewngyto gave a shirt to?'

So far, all of the example sentences brought to bear on this discussion have come from question-forming *wh*-movement, although that is not the only phenomenon involving movement of a nominal that can potentially cross a clause boundary: if my proposal is correct, we might also expect to find similar data involving cross-clausal scrambling or long distance relativization of an absolutive noun phrase. Unfortunately, the first of the two appears to be untestable, as no speaker that I have worked with has accepted sentences with a noun phrase scrambled out of a finite clause. However, a few of my consultants accept cross-clausal relativization, which shows the case effects seen with question-forming *wh*-movement: when the relative pronoun *meŋin* moves into the higher clause in the relative clause, it forces the subject to bear ergative case.[32]

(259) a. ʔujemtewilʔ-ə-n [meŋin$_i$ ɣəm-nan t-ə-valom-ə-n
person-EP-ABS.SG which.ABS.SG 1SG-ERG 1SG.S/A-EP-hear-EP-3SG.O

[əno ɣə-nan ∅-kətʔajŋa-n t_i]] wutku
that 2SG-ERG 2/3.S/A.IND-scold-3SG.O here

∅-ku-jun-et-ə-ŋ-∅
2/3.S/A.IND-PRS-live-VBLZ-EP-PRS-3.S.IND
'The person who I heard you scolded lives here.'

b. *ʔujemtewilʔ-ə-n [meŋin$_i$ ɣəmmo t-ə-valom-ə-k
person-EP-ABS.SG which.ABS.SG 1SG.ABS 1SG.S/A-EP-hear-EP-1SG.S

[əno ɣə-nan ∅-kətʔajŋa-n t_i]] wutku
that 2SG-ERG 2/3.S/A.IND-scold-3SG.O here

∅-ku-jun-et-ə-ŋ-∅
2/3.S/A.IND-PRS-live-VBLZ-EP-PRS-3.S.IND
intended: 'The person who I heard you scolded lives here.'

[32]Most speakers I have consulted about long-distance relativization do not allow it regardless of the case effects. This is somewhat surprising since long-distance relativization involves long-distance *wh*-movement, which, as we have seen, is permitted in the language. This behavior is not unique to Koryak, however, as there are languages that treat *wh*-movement and relativization differently. As Polinsky (2017) shows, Koryak's close relative Chukchi allows ergative-marked noun phrases to undergo *wh*-movement, but does not allow them to be the pivot of a relative clause (though both are allowed in Koryak). Additionally, while Dutch robustly allows long-distance question-forming *wh*-movement (Strik 2008; Schippers 2010), long distance relativization is reported to be found only in some dialects (Barbiers et al. 2005).

4.4.3 Triggering New Datives

In previous section, I showed how moving an absolutive *wh*-word into a higher case domain results in the external argument of the verb in that case domain bearing ergative case. As I have argued, there is also evidence for taking at least some instances of dative to also be dependent cases: those datives arise on the goal argument of the verb 'give', which has two absolutive internal arguments. If dative can be a dependent case and dependent case can be triggered by *wh*-movement, we should then expect that *wh*-moved absolutive nominals can also trigger dependent dative on the absolutive internal argument of object control verbs like *jəmitətvat-* 'teach', whose internal argument is absolutive-marked when no movement has crossed it, as shown in (260a). As (260b) shows, this expectation is correct: when the absolutive *wh*-word *jeju* 'what all' crosses the matrix object, that object bears dative case.

(260) a. ɣəm-nan t-ə-ku-n-mit-ə-tv-aɲ-ŋ-ə-na-w
1SG-ERG 1SG.S/A-EP-PRS-CAUS-skilled-EP-INCH.VBLZ-VBLZ-PRS-EP-3.O-3PL

{jejɣut͡ɕewŋəlʔ-u / *jajɣot͡ɕawŋəlʔ-ə-ŋ} kali-k predloʒenija-w
{student-ABS.PL / student-EP-DAT} write-INF sentence-ABS.PL
'I am teaching the students to write sentences.'[33]

b. jej-u$_i$ ɣə-nan
what-ABS.PL 2SG-ERG

∅-ku-n-mit-ə-tv-aɲ-ŋ-ə-na-w
2/3.S/A.IND-PRS-CAUS-skilled-EP-INCH.VBLZ-VBLZ-PRS-EP-3.O-3PL

{jajɣot͡ɕawŋəlʔ-ə-ŋ / *jejɣut͡ɕewŋəlʔ-u} kali-k t_i?
{student-EP-DAT / student-ABS.PL} write-INF
'What all are you teaching the students to write?'

Some speakers also use an additional verb for 'teach', *jəɣəjulev-*, which shows the same case effects as *jəmitətvat-*, as exemplified in (261). As I have considerably more data for *jəmitətvat-* than for *jəɣəjulev-*, I will restrict my discussion to the former for the rest of this section.

(261) a. ɣəm-nan t-ə-ku-n-ɣəjul-ew-ŋ-ə-n-∅
1SG-ERG 1SG.S/A-EP-PRS-CAUS-learn-VBLZ-PRS-EP-3.O-SG

{kaʌaʔaŋ / *kaʌaʔaŋ-ə-na-ŋ} tejk-ə-k
Kaljahang.ABS.SG / Kaljahang-EP-OBL.SG-DAT make-EP-INF

[33]For reasons that are unclear to me, the data regarding 'teach' seems to be subject to some intraspeaker variation. In particular, there are certain speakers for whom the judgment in (260a) occasionally alternates with a judgment whereby both the absolutive and dative are grammatical. If this represents the coexistence of two grammars within these speakers (as opposed to confusion about the sentences or L2 interference), the more permissive grammar is part of the same one that derives the facts seen with *wiŋŋet-* 'help', as described in §4.7.1.

ʔeʌut͡ɕ-u
doll-ABS.PL
'I am teaching Kaljahang to make dolls.'

b. jeq-uji**t͡ɕ**v-ineŋ-u$_i$ ɣə-nan
what-play-TOOL-ABS.PL 2SG-ERG

∅-ku-n-ɣəjul-ew-ŋ-ə-n-∅
2/3.S/A.IND-PRS-CAUS-learn-VBLZ-PRS-EP-3.O-SG

{kaʌaʔaŋ-ə-na-ŋ / *kaʌaʔaŋ} tejk-ə-k t_i?
Kaljahang-EP-OBL.SG-DAT / Kaljahang.ABS.SG make-EP-INF
'What kind of toys are you teaching Kaljahang to make?'

I have argued that the crucial difference between dependent and lexical datives is that the former, but not the latter, can trigger verbal agreement (cf. 238a, repeated below as 262a), whereas and inherent/lexical dative cannot trigger verbal agreement (cf. 238b, repeated below as 262b).

(262) a. t-ə-jəl-ɣi ɣən-k-ə-ŋ kewl-əpa-ŋa
1SG.S/A-EP-give-2SG.O 2SG-OBL-EP-DAT blood-soup-ABS.SG
'I gave you blood soup.'

b. {t-ə-t͡ɕejm-ev-ə-k / *t-ə-t͡ɕejm-ew-ɣi}
{1SG.S/A-EP-close-VBLZ-EP-1SG.S / 1SG.S/A-EP-close-VBLZ-2SG.O}

ɣən-k-ə-ŋ
2SG-OBL-EP-DAT
'I approached you.'

The prediction, then, is that if the dative case that occurs on objects that an absolutive DP has moved past is dependent, then that object should be eligible for agreement. The sentence in (260b) does not show this, as 3rd person datives are never agreed with. However, local person datives can be agreed with, and replacing the object of 'teach' with a 2nd person pronoun, as in (263), results in the matrix verb agreeing with this dative-marked object.

(263) jaq-uji**t͡ɕ**v-inaŋ-u$_i$[34] *pro*$_{3pl}$
what-play-TOOL-ABS.PL 3PL.ERG

na-ko-n-met-ə-tv-al-la-ŋ-tək {toj-k-ə-ŋ
INV-PRS-CAUS-skilled-EP-INCH.VBLZ-VBLZ-PL-PRS-2NSG.S/O 2NSG-OBL-EP-DAT

/ *tuj-u} tejk-ə-k t$_i$
/ *2NSG-ABS.PL make-EP-INF
'What toys are they teaching you all to make?'

[34]The difference between the shape of the word for 'which toys', *jaqujit͡ɕvinaŋu* in this example and *jequjit͡ɕvineŋu* in (261b) is due to interspeaker variation in the harmony class that the root *ujit͡ɕv-* 'play' belongs to.

We might wonder whether a sentence like (260b) really involves long-distance movement of *jeju* from the complement of *kali-* to the matrix [Spec,CP], or whether the *wh*-word is actually an argument of the higher verb 'teach', as in something like 'What are you teaching the students?'[35] However, as (264) shows, *jəmitətvat-* cannot select a theme as its complement and mark the goal with dative case. A close look at the structure of the verb in question, which is derived by taking the adjectival root 'be skilled' (265a), verbalizing it with the inchoative verbalizer *-tvi* (265b)[36], and subsequently causativizing it (265c), shows that the unacceptability of (264) is not unexpected, as it literally means 'to make someone skilled at something' (cf. *#I made reading skilled at the students.*)

(264) *inenɣəjulevətɕ͡?-ə-ne-k
teacher-EP-OBL.SG-ERG

∅-ku-n-mit-ə-tv-aɲ-ŋ-ə-nin
2/3.S/A.IND-PRS-CAUS-skilled-EP-INCH.VBLZ-VBLZ-PRS-EP-3SG.A>3.O

kale-jəlŋ-at-ɣəjŋ-ə-n jajɣotɕ͡awŋəl?-ə-jək-ə-ŋ
book-read-VBLZ-NMLZ-EP-ABS.SG student-EP-OBL.NSG-EP-DAT
intended: 'The teacher is teaching reading to the students.'

(265) a. n-ə-mit-qin-∅ kale-jəlŋ-at-ə-k
ADJ-EP-skilled-ADJ-SG book-read-VBLZ-EP-INF
'(He/She is) skilled at reading.'

b. mit-ə-tvi-k kale-jəlŋ-at-ə-k
skilled-EP-INCH.VBLZ-INF book-read-VBLZ-EP-INF
'to become skilled at reading'

c. j-ə-mit-ə-tv-at-ə-k kale-jəlŋ-at-ə-k
CAUS-EP-skilled-EP-INCH.VBLZ-VBLZ-EP-INF book-read-VBLZ-EP-INF
'to teach someone to read (lit. to make someone skilled at reading)'

A counterproposal to the claim that the dative case is on the matrix object is due to the movement of an absolutive *wh*-word past it is that the dative is actually due to this sentence's being a question. In the previous section, we saw that this was not tenable for ergative on the subject, and the sentence in (266) shows the same thing for the dative-marked object: this sentence is a *wh*-question, but the object of 'teach' is required to be absolutive.

(266) mikə-ne-k$_i$ t_i
who-OBL.SG-ERG

∅-ku-n-mit-ə-tv-aw-ŋ-ə-nin[37]
2/3.S/A.IND-PRS-CAUS-skilled-EP-INCH.VBLZ-VBLZ-PRS-EP-3SG.A>3.O

[35]This, of course, leaves the existence of the infinitive *kalik* 'to write' a mystery.

[36]The verbalizer *-at*, which the causative prefix in (265c) requires the verb-word to bear, causes the final vowel of *-tvi* to delete, giving the surface form *-tv* seen in (265c).

{qaj-ə-kmiŋ-u / *qaj-ə-kmeŋ-ə-ŋ} j-ə-ɲŋ-ev-ə-k
{DIM-EP-child-ABS.PL / *DIM-EP-child-EP-DAT} CAUS-EP-grow-VBLZ-EP-INF

utt-u?
tree-ABS.PL
'Who is teaching the children to plant trees?'

Another counterproposal to the claim advanced here is that, while the change in case morphology on the goal of 'teach' may be related to the presence of *wh*-movement across the goal, it is not the fact that the moving element is absolutive that triggers the change in case, but merely the fact that some *wh*-element is moving across the goal that causes its case to change. This makes the prediction that we should see the same dative marking on the goal of 'teach' regardless of the case of the moving element. Recall from the previous subsection that we could not test this with the complement of the clause-embedding verb *valom-* 'hear' because only absolutives can move out of a finite clause. However, no such restriction exists for nonfinite clauses, which *teach* takes as its complement. Consequently, we use non-finite clauses to test whether the moving element must be absolutive to trigger the change in case on the goal. This is illustrated in the questions in (267-268). In the former, a noun phrase with locative case moves out of the lower clause, and in the latter, a noun marked with instrumental case moves out of it. In both cases, the case on the goal is absolutive, like in the declarative counterpart, and unlike what we saw when the moving element was itself absolutive in previous examples. These data provide further support for analyzing this case alternation as the result of dependent case competition, it is dependent on the moving element's having absolutive case.

(267) a. jeq-ə-k$_i$ ine-n-ɣəjuʌ-ev-ə-t͡ɕʔ-e
what-EP-LOC AP-CAUS-learn-VBLZ-EP-S/O.PTCP-ERG

na-ko-n-met-ə-tv-al-la-ŋ-tək {tuj-u
INV-PRS-CAUS-skilled-EP-INCH.VBLZ-VBLZ-PL-PRS-2NSG.S/O {2NSG-ABS.PL

/ *toj-k-ə-ŋ} kali-k predloʒenija-w t_i?
/ *2NSG-OBL-EP-DAT} write-INF sentence-ABS.PL
'In what is the teacher teaching you all to write sentences?'

b. ine-n-ɣəjuʌ-ev-ə-t͡ɕʔ-e
AP-CAUS-learn-VBLZ-EP-S/O.PTCP-ERG

na-ko-n-met-ə-tv-al-la-mək muj-u
INV-PRS-CAUS-skilled-EP-INCH.VBLZ-VBLZ-PL-1NSG.S/O 1NSG-ABS.PL

kali-k predloʒenija-w tetradj-ə-k.
write-INF sentence-ABS.PL notebook-EP-LOC
'The teacher is teaching us to write sentences in a notebook.'

[37]The speaker who provided this sentence uses the verbalizer *-ev* rather than *-et* for this verb, giving (after applying the relevant phonological rules) *kunmitətvawŋənin* rather than *kunmitətvaŋŋənin*, which all other speakers I have consulted produce.

(268) a. jaq-kale-ɣəjŋ-a ine-n-ɣəjuʎ-ev-ə-t͡ɕʔ-e
what-write-NMLZ-INST AP-CAUS-learn-VBLZ-EP-S/O.PTCP-ERG

na-ko-n-met-ə-tv-al-la-ŋ-tək {tuj-u
INV-PRS-CAUS-skilled-EP-INCH.VBLZ-VBLZ-PL-PRS-2NSG.S/O {2NSG-ABS.PL

/ *toj-k-ə-ŋ} kali-k bukva-w?
/ *2NSG-OBL-EP-DAT} write-INF letter-ABS.PL
'In what alphabet is the teacher teaching you all to form letters?'

b. ine-n-ɣəjuʎ-ev-ə-t͡ɕʔ-e
AP-CAUS-learn-VBLZ-EP-S/O.PTCP-ERG

na-ko-n-met-ə-tv-al-la-mək muj-u
INV-PRS-CAUS-skilled-EP-INCH.VBLZ-VBLZ-PL-1NSG.S/O 1NSG-ABS.PL

kali-k bukva-w latini͡tsa-ta
write-INF letter-ABS.PL Latin.alphabet-INST
'The teacher is teaching us to form letters in the Latin alphabet.'

4.4.4 Summary

In this section I have shown that the movement of an absolutive *wh*-element across another absolutive noun causes that noun to bear a case it would otherwise not have: ergative for absolutive subjects, and dative for absolutive objects. I have also shown that there is no possible other characterization of the conditions under which this change in nouns' case marking takes place. In the next section, I will provide an analysis of these facts by combining the theories of dependent case and successive-cyclic movement.

4.5 Analysis

The analysis I propose falls out straightforwardly from combining dependent case theory with a version of successive cyclicity. In particular, I will show that adopting a theory of successive-cyclic movement in which (at least) C and v are phase heads, and stipulating that *each* step in a nominal's movement chain is one that dependent case can be triggered from, account for all of the data under discussion. Let's begin with the derivation of ergative case on the subject of a transitive verb where no movement takes place. Recall from (217) that the subject of a verb whose complement is absolutive is invariably marked with ergative case, as exemplified in (269), repeated from (217a) above.

(269) ɣəm-nan t-ə-nu-ne-w ʔəvənʔ-u
1SG-ERG 1SG.S/A-EP-eat-3.O-3PL berry-ABS.PL
'I ate berries.'

Following Marantz (1991), I take dependent case to be assigned to at least one of two caseless nominals in a dependent case domain. Whether dependent case is assigned to

the higher argument or to the lower argument (or to both, as in tripartite languages) in a particular domain is determined on a language-specific basis: dependent accusative is assigned to the lower of two arguments of a transitive verb, whereas dependent ergative is assigned to the higher of the two.[38] Following Baker (2015), I take phase heads to demarcate the upper and lower bounds of dependent case domains: C demarcates the upper bound of the ergative case domain and the lower bound of the dative case domain, and v demarcates the upper bound of the dative case domain and the lower bound of the ergative case domain.[39] The object is generated as the complement of the verb (270a), and then moves to the specifier of the vP, where it triggers ergative case on the matrix subject.[40] To make the diagrams simpler, I have omitted the TP projection as well as the movement of the external argument from the specifier of vP to the specifier of TP, and simply represent the external argument between C and vP.

(270) a. [$_{CP}$ [C I [$_{vP}$ [v [$_{VP}$ ate berries]]]]]
domain of ERG

b. [$_{CP}$ [C I$_{ERG}$ [$_{vP}$ berries [v [$_{VP}$ ate _]]]]]
domain of ERG

Now let us consider extraction from the complement of *valom-* 'hear', shown in (271a) (repeated from (245) above). Recall that, in this case, the movement of an absolutive *wh*-word from the embedded clause forces the matrix subject to bear ergative case.

(271) a. jej-u$_i$ {ɣə-nan / *ɣə͡tɕ͡tɕi} ∅-valom-na-w, əno
what-ABS.PL {2SG-ERG / 2SG.ABS} 2/3.S/A.IND-hear-3.O-3PL that

ʔewŋəto-na-k ∅-j-ə-t͡ɕim-aw-nin t_i
Hewngyto-OBL.SG-ERG 2/3.S/A.IND-CAUS-EP-break-VBLZ-3SG.A>3.O
'What all did you hear that Hewngyto broke?'

b. ɣəmmo t-ə-valom-ə-k, əno ʔewŋəto-na-k
1SG.ABS 1SG.S/A-EP-hear-EP-1SG.S that Hewngyto-OBL.SG-ERG

∅-j-ə-t͡ɕim-aw-nin kojŋ-o
2/3.S/A.IND-CAUS-EP-break-VBLZ-3SG.A>3.O cup-ABS.PL
'I heard that Hewngyto broke cups.'

The sentence in (271a) is derived by successive-cyclic movement of *what* triggering ERG on the subjects of both clauses when it is in their respective [Spec,vP], and not triggering any dependent cases when it is in the specifier of the clauses' CPs. This is schematized

[38]Note that Yuan (2018) argues for Inuktitut that dependent ergative is assigned to the lower of the two arguments of a transitive verb after the object has moved above the subject.

[39]Note that this differs from the simpler implementation of dependent case that I sketched out in (4.2.1). The motivation for this is addressed in §4.6.

[40]The motivations for this step of movement in non-interrogative sentences are addressed in §4.6.

in (272): the *wh*-word first starts in the embedded object position (272a), then moves to the specifier of the embedded vP, where it triggers ergative on the embedded subject (272b). The *wh*-word then moves to the specifier of the embedded CP, where it triggers no dependent case as there are no other caseless noun phrases in the relevant domain (272c), then to the matrix [Spec,vP], where it triggers dependent ergative on the matrix subject by virtue being the lower of two caseless nominals in one dependent case domain (272d). Finally, it undergoes a case-neutral movement to the matrix [Spec,CP] (272e).[41]

(272) a. [$_{CP}$ [C_{wh} you [$_{vP}$] [v [$_{VP}$ hear [$_{CP}$ [that Hewngyto [$_{vP}$] [v [$_{VP}$ broke what]]]]]]]]]]

domain of ERG *domain of ERG*

b. [$_{CP}$ [C_{wh} you [$_{vP}$] [v [$_{VP}$ hear [$_{CP}$ [that Hewngyto$_{ERG}$ [$_{vP}$ what] [v [$_{VP}$ broke _]]]]]]]]]]

domain of ERG *domain of ERG*

c. [$_{CP}$ [C_{wh} you [$_{vP}$] [v [$_{VP}$ hear [$_{CP}$ what [that Hewngyto$_{ERG}$ [$_{vP}$ _] [v [$_{VP}$ broke _]]]]]]]]]]

domain of ERG *domain of ERG*

d. [$_{CP}$ [C_{wh} you$_{ERG}$ [$_{vP}$ what] [v [$_{VP}$ hear [$_{CP}$ _ [that Hewngyto$_{ERG}$ [$_{vP}$ _ ...]]]]]]]]

domain of ERG *domain of ERG*

e. [$_{CP}$ what [C_{wh} you$_{ERG}$ [$_{vP}$ _] [v [$_{VP}$ hear [$_{CP}$ _ [that Hewngyto$_{ERG}$ [$_{vP}$ _ ...]]]]]]]]

Unlike in (271a), (271b) the absolutive wh-word moves only as far as the embedded [Spec,vP] (273b), triggering ergative case only on the embedded subject, and leaving the matrix subject absolutive.

(273) a. [$_{CP}$ [C you [$_{vP}$] [v [$_{VP}$ hear [$_{CP}$ [that Hewngyto [$_{vP}$] [v [$_{VP}$ broke cups]]]]]]]]]]

domain of ERG *domain of ERG*

b. [$_{CP}$ [C you [$_{vP}$] [v [$_{VP}$ hear [$_{CP}$ [that Hewngyto$_{ERG}$ [$_{vP}$ cups] [v [$_{VP}$ broke _]]]]]]]]]]

Consider now the derivation of sentences with dependent dative case. In the simpler case, when *wh*-movement is not implicated, such a sentence involves the ditransitive verb *jəl-* 'give', as schematized in (274), repeated from (238a) and (262a) above.

(274) t-ə-jəl-ɣi ɣən-k-ə-ŋ kewl-əpa-ŋa
1SG.S/A-EP-give-2SG.O 2SG-OBL-EP-DAT blood-soup-ABS.SG
'I gave you blood soup.'

Both internal arguments are generated without case (275a), but the presence of two caseless nominals in the domain of dependent dative causes the higher of the two to be marked with dative case (275b). After this occurs, the object moves to the specifier of vP, where it triggers dependent ergative on the subject (275c).

[41] The diagrams in (272) has the attracting *wh* feature only on the matrix C, and not on any of the intervening phase heads. This representation was chosen for simplicity, and should not be taken to be an endorsement of any particular view of how the individual steps of successive-cyclic movement are triggered. See Heck and Müller (2003) and sources therein for various relevant proposals.

(275) a. *domain of ERG* *domain of DAT*
[$_{CP}$ [C I [$_{vP}$ [v [$_{VP}$ you [gave blood soup]]]]]]

b. *domain of ERG* *domain of DAT*
[$_{CP}$ [C I [$_{vP}$ [v [$_{VP}$ you$_{DAT}$ [gave blood soup]]]]]]

c. *domain of ERG* *domain of DAT*
[$_{CP}$ [C I$_{ERG}$ [$_{vP}$ blood soup [v [$_{VP}$ you$_{DAT}$ [gave _]]]]]]

The same configuration arises as a result of an intermediate step of *wh*-movement in sentences like (276a) (repeated from (260b) above), where movement of the absolutive *wh*-word to the left periphery of the matrix clause results in the matrix object bearing dative case, rather than the absolutive that it bears when *wh*-movement has not taken place (276b).

(276) a. jej-u$_i$ ɣə-nan
what-ABS.PL 2SG-ERG

∅-ku-n-mit-ə-tv-aɲ-ŋ-ə-na-w
2/3.S/A.IND-PRS-CAUS-skilled-EP-INCH.VBLZ-VBLZ-PRS-EP-3.O-3PL

{jajɣo͡tɕawŋəlʔ-ə-ŋ / *jejɣu͡tɕewŋəlʔ-u} kali-k t_i
{student-EP-DAT / *student-ABS.PL} write-INF
'What all are you teaching the students to write?'

b. ɣəm-nan t-ə-ku-n-mit-ə-tv-aɲ-ŋ-ə-na-w
1SG-ERG 1SG.S/A-EP-PRS-CAUS-skilled-EP-INCH.VBLZ-VBLZ-PRS-EP-3.O-3PL

{jejɣu͡tɕewŋəlʔ-u / *jajɣo͡tɕawŋəlʔ-ə-ŋ} kali-k predloʒenija-w
{student-ABS.PL / *student-EP-DAT} write-INF sentence-ABS.PL
'I am teaching the students to write sentences.'

The derivation of (276a) is schematized in (277). The *wh*-word is first generated as the complement of the embedded verb (277a), and then moves to the specifier of the embedded vP, where it presumably triggers ergative case on the embedded PRO subject (277b).[42] It then moves to the embedded [Spec,CP], which is part of the same dependent case domain as the caseless matrix object. Since dative is assigned to the higher of the two caseless nominals in its domain, the matrix object gets marked with dative case (277c). From there, the *wh*-word moves to the specifier of the matrix vP, triggering ergative case on the matrix subject (277d), and then to the specifier of the matrix CP, case-inertly (277e).[43]

[42]None of the tests that I am aware of that have been used to diagnose the case that PRO bears in languages like Icelandic (Sigurðsson 1991) or Russian (Franks 1995) are applicable in Koryak, so we can neither confirm nor deny that the PRO is actually assigned ergative case.

[43]Note that it is necessary for the moving *wh*-word to already be in the embedded [Spec,CP] when material from the higher clause merges, in order to prevent the matrix object from moving out of the VP, and thus becoming ineligible for dependent dative. This may speak in favor of having a *wh*-feature on intervening C heads in long-distance *wh*-movement.

(277) a. [$_{CP}$ [C_{wh} you [$_{vP}$ [v [$_{VP}$ students [teach [$_{CP}$ [C [PRO [$_{vP}$ [v [$_{VP}$ write what]]]]]]]]]]

domain of ERG *domain of DAT* *domain of ERG* *domain of DAT*

b. [$_{CP}$ [C_{wh} you [$_{vP}$ [v [$_{VP}$ students [teach [$_{CP}$ [C [PRO_{ERG} [$_{vP}$ what [v [$_{VP}$ write _]]]]]]]]]]

domain of ERG *domain of DAT* *domain of ERG* *domain of DAT*

c. [$_{CP}$ [C_{wh} you [$_{vP}$ [v [$_{VP}$ $students_{DAT}$ [teach [$_{CP}$ what [C [PRO_{ERG} [$_{vP}$ _ [v [$_{VP}$ write _]]]]]]]]]]

domain of ERG *domain of DAT* *domain of ERG* *domain of DAT*

d. [$_{CP}$ [C_{wh} you_{ERG} [$_{vP}$ what [v [$_{VP}$ $students_{DAT}$ [teach [$_{CP}$ _ [...]]]]]]]]

domain of ERG *domain of DAT*

e. [$_{CP}$ what [C_{wh} you_{ERG} [$_{vP}$ _ [v [$_{VP}$ $students_{DAT}$ [teach [$_{CP}$ _ [...]]]]]]]]

domain of ERG *domain of DAT*

4.6 The Position of Direct Objects

4.6.1 Background

I have so far assumed that dependent ergative on a subject is triggered by a caseless element in [Spec,vP]. I have not yet defended this, though it is necessary to do so: in the simplest version of the theory of dependent case, where the case domains are defined as extending from phase to phase, the fact that the object is generated within the VP, whereas the subject is generated outside of v (Kratzer 1996; Wurmbrand 2001), means that the object must move at least as high as [Spec,vP] in order for the subject to be marked ergative, or, in an accusative language, for the object to be marked accusative. Now, in some languages with dependent case, such as Sakha (Turkic), object movement to [Spec,vP] is easy to diagnose since the presence of accusative on the object depends on its position with respect to low adverbs: if the object follows such an adverb (278a), it must, all else being equal, bear nominative case. However, if it precedes such adverbs, having moved out of the VP, it must be marked accusative (278b).

(278) a. Masha [$_{VP}$ türgennik salamaat-(#y) sie-te]
Masha quickly porridge-ACC eat-PST.3SG.SBJ
'Masha ate porridge quickly.'[44] Baker and Vinokurova (2010, 602)

b. Masha salamaat-*(y) [$_{VP}$ türgennik _ sie-te]
Masha porridge-ACC quickly eat-PST.3SG.SBJ
'Masha ate the porridge quickly.' (ibid.)

[44] Accusative marking on a VP-internal object requires it to be focused.

Despite the relationship between VP-internality of objects and dependent case in Sakha, there exist languages, like Cuzco Quechua (Quechuan), where the object must bear accusative case marking, even if occurs between the goal and the verb, having remained inside the VP (279). As we saw in §4.2.3, Koryak is like Cuzco Quechua: regardless of the position of the arguments relative to each other and the verb, the subject of a transitive verb with an absolutive object is marked with ergative case.

(279) Juan wawakuna-man miski-*(ta) qunpuni.
Juan children-DAT candy-ACC give.HAB.3SG.SBJ
'Juan gives candy to the children.' Baker (2015, 146)

Baker's solution to this is to appeal to a distinction between hard and soft phases, where a hard phase behaves as expected (it delimits a spellout domain and is a barrier to syntactic operations triggered from outside of it), whereas a soft phase delimits a spellout domain, but does not constitute a barrier to outside syntactic operations. This allow case calculus, for example, to ignore soft phase boundaries, but not hard ones. By positing that languages can vary parametrically as to the hardness of their phases, Baker is able to account for the difference between Sakha and Cuzco Quechua by positing that Sakha has a hard phase introduced by v, whereas the Cuzco Quechua v introduces a soft phase, allowing a VP-internal nominal to compete for case with the subject and thereby be assigned accusative. As a result of this, the dependent case domain for dative is included within the dependent case domain for accusative, as schematized in the derivation in (280). Once the v has merged with the VP, case competition for dative takes place, which is assigned to the higher of the two noun phrases in VP. Subsequently, the rest of the structure merges up to C, which triggers a second round of case competition, this time for accusative, which is assigned to the lower of the caseless DPs in TP. Since v introduces a soft phase in Cuzco Quechua, the direct object is eligible to receive accusative case.

(280) a. [v [$_{VP}$ children$_{DAT}$ [candy gives]]]
domain of DAT

b. [$_{CP}$ C [$_{TP}$ Juan [T [$_{vP}$ _ [v [$_{VP}$ children$_{DAT}$ [candy$_{ACC}$ gives]]]]]]]
domain of ACC *domain of DAT*

4.6.2 The Problem

Given that the ergative of Koryak seems to pattern like the accusative of Cuzco Quechua, it is tempting to posit that the phase introduced by v in Koryak is also a soft phase. However, this makes an incorrect prediction about movement triggering ergative case. If the soft phase approach to the Koryak v is correct, the *wh*-word in the specifier of CP should trigger ergative on the matrix subject in the absence of a matrix internal argument, as schematized

in (281). As the sentences in (282) show, this is not correct: the movement of an absolutive *wh*-word to the specifier of the embedded CP cannot cause the matrix subject to bear ergative case. We are therefore forced to posit that v introduces a hard phase in Koryak (257b also showed this).

(281) *domain of ERG* *domain of DAT*

$[_{CP}$ [C DP_{ERG} $[_{vP}$ _ [v $[_{VP}$ V $[_{CP}$ DP_{wh}] [C DP_{ERG} $[_{vP}$ _ [v $[_{VP}$ V _]]]]]]]]]]

(282) a. ɣəmmo t-ə-ku-t͡ɕetkejuŋ-ə-ŋ-∅
1SG.ABS 1SG.S/A-EP-PRS-think-EP-PRS-3.S.IND

jeq-qevi-jət͡ɕʔ-u m-ə-jəl-ne-w
which-gift-contents-ABS.PL 1SG.S/A.IMP-EP-give-3.O-3PL

ʔewŋəto-na-ŋ ənək-eto-ʔəlwəje-ŋ
Hewngyto-OBL.SG-DAT 3SG.POSS-birth-day-DAT
'I am wondering what gifts I should give Hewngyto for his birthday.'

b. *ɣəm-nan t-ə-ku-t͡ɕetkejuŋ-ŋ-ə-ne-w
1SG-ERG 1SG.S/A-EP-PRS-think-EP-PRS-3.O-3PL

jeq-qevi-jət͡ɕʔ-u m-ə-jəl-ne-w
which-gift-contents-ABS.PL 1SG.S/A.IMP-EP-give-3.O-3PL

ʔewŋəto-na-ŋ ənək-eto-ʔəlwəje-ŋ
Hewngyto-OBL.SG-DAT 3SG.POSS-birth-day-DAT
intended: 'I am wondering what gifts I should give Hewngyto for his birthday.'

If v introduces a hard phase, the fact that the subject of a transitive verb is always marked ergative requires that we postulate obligatory movement of an absolutive noun phrase out of the VP and above v. Now, given that word order is highly unconstrained and that we don't know what syntactic mechanisms are involved in building verb-words (which could give us a clue as to how high the lexical verb is), there are no obvious diagnostics for establishing whether or not the object has moved out of the VP. On the other hand, this also means that the word order data is *consistent* with the hypothesis that the object moves out of the VP: whatever linear position the object is in with respect to the other words in the clause, there is a syntactic structure consistent with it whereby the object has moved out of the vP.

At this point, we could simply postulate that an absolutive object has to move out the VP, and accept that it is an unmotivated stipulation that is necessary to get this analysis working. However, there is some evidence from the pattern of agreement in clauses with the ditransitive verb *jəl-* 'give' that suggests that the absolutive argument must move outside the vP. I sketch this out in the next subsection.

4.6.3 Agreement in Ditransitives

As we saw above, Koryak does not allow agreement with dative-marked arguments unless the dative case is dependent, and (for the most part) the only verb that controls such a pattern of agreement is *jəl-* 'give'. However, whether or not the verb agrees with the dative argument depends on the person specification of the two arguments. In particular, if one of the internal arguments of the verb, but not both of them, is a speech-act participant (SAP), the SAP argument is agreed with (283-284). However, if both (285) or neither (286) of the arguments are SAPs, the absolutive theme must be agreed with.

(283) a. ɣəm-nan t-ə-jəl-ɣi ənk-ə-ŋ ɣə͡tɕt͡ɕi
1SG-ERG 1SG.S/A-EP-give-2SG.O 3SG-EP-DAT 2SG.ABS
'I gave you to him.'

b. ə-nan ∅-ine-jəl-i ənk-ə-ŋ ɣəmmo
3SG-ERG 2/3.S/A.IND-1SG.O-give-AOR 3SG-EP-DAT 1SG.ABS
'He gave me to him.'

(284) a. ɣəm-nan t-ə-jəl-ɣi ɣən-k-ə-ŋ urvaq
1SG-ERG 1SG.S/A-EP-give-2SG.O 2SG-OBL-EP-DAT shirt.ABS.SG
'I gave a shirt to you.'

b. ə-nan ∅-ine-jəl-i ɣəm-k-ə-ŋ urvaq
3SG-ERG 2/3.S/A.IND-1SG.O-give-AOR 1SG-OBL-EP-DAT shirt.ABS.SG
'He gave a shirt to me.'

(285) a. jequ = ʔam ɣəmmo ɣən-k-ə-ŋ ne-jəl-ɣəm?
why = FOC 1SG.ABS 2SG-OBL-EP-DAT INV-give-1SG.O
'Why did they give me to you?'

b. ə-nan {ne-jəl-ɣi / *∅-ine-jəl-i} ɣə͡tɕt͡ɕi
3SG-ERG {INV-give-2SG.O / *2/3.S/A.IND-1SG.O-give-AOR} 2SG.ABS

ɣəm-k-ə-ŋ
1SG-OBL-EP-DAT
'He gave you to me.'

(286) {t-ə-jəl-ə-n / *t-ə-jəl-ne-w}
1SG.S/A-EP-give-EP-3SG.O / *1SG.S/A-EP-give-3.O-3PL

əj-k-ə-ŋ kali-kal
3NSG-OBL.NSG-EP-DAT book-ABS.SG
'I gave a book to them.'

Given that either of the two internal arguments can, in principle, be agreed with, we cannot appeal to case-discrimination by the probe to account for why it prefers to agree with the absolutive when there is no asymmetry in SAP-hood between the two internal arguments. Further, assuming Baker (1985)'s Mirror Principle, the relevant probe is quite high in the syntactic structure: object agreement is the rightmost morpheme on the verb,

and both tense and aspect morphology are inside of it; in line with Bobaljik (2000)'s work on closely the closely related Chukchi, I take the relevant probe to be on or just above T. Consequently, it is not possible to argue that the probe is located below the dative-marked argument but above the absolutive-marked one. Since the absolutive argument is syntactically lower than the dative, the pattern that we find seems to be exactly the opposite of what we would expect: instead of the probe defaulting to the closer argument, it defaults to the one that is further away.[45] Positing an obligatory step of movement of the absolutive to [Spec,vP] (287) causes the agreement pattern to fall out unproblematically: in the spirit of Deal (2015)'s distinction between interaction and satisfaction in agreement, the probe can be specified to search for a participant argument, but, in the absence of one, to agree with the closest nominal. By the same principle, if there are two participant arguments, it will agree with the closest one.

(287) a. [$_{CP}$ [C I [$_{vP}$ [v [$_{VP}$ you [gave blood soup]]]]]]
domain of ERG *domain of DAT*

b. [$_{CP}$ [C I [$_{vP}$ [v [$_{VP}$ you$_{DAT}$ [gave blood soup]]]]]]
domain of ERG *domain of DAT*

c. [$_{CP}$ [C I$_{ERG}$ [$_{vP}$ blood soup [v [$_{VP}$ you$_{DAT}$ [gave _]]]]]]
domain of ERG *domain of DAT*

4.6.4 Summary

In this section, I have shown that we cannot analyze the Koryak v as an introducer of a soft phase. Since an absolutive object invariably triggers ergative on a higher coargument object, however, it is necessary to posit a step of movement by the absolutive DP out of the VP. I have argued that evidence from the pattern of agreement in ditransitives supports exactly the step of movement necessary for a hard-phase approach to v to work. This provides indirect evidence for positing an obligatory step of movement for which there is no direct evidence from linear order.

4.7 Consequences

4.7.1 A Curious Extraction Restriction Solved

The proposal advanced in §5.4, that moving *wh*-words trigger dependent case competition along their movement paths, solves a problem concerning extraction from the complement of the verb *wiŋŋet-* 'help' that is otherwise unexplained. The problem boils down to the following: whereas this verb can take three possible case frames when its complement is

[45] A similar problem is found in both of the other living Chukotkan languages (Chukchi and Alutor,) though the data are slightly different (Bárány 2020).

a transitive verb, absolutive-dative (288a), ergative-absolutive (288b), or ergative-dative (288c), the movement of an absolutive *wh*-word from the complement of 'help' into the left periphery of the matrix clause requires it to have the ergative-dative case frame (289).[46]

(288) a. ʔewŋəto ∅-wiɲɲet-i meʌʌo-na-ŋ kali-k
Hewngyto.ABS.SG 2/3.S/A.IND-help-AOR Melljo-OBL.SG-DAT write-INF

pismo-n
letter-ABS.SG
'Hewngyto helped Melljo write the letter.'

b. ʔewŋəto-na-k ∅-wiɲɲen-nin meʌʌo
Hewngyto-OBL.SG-ERG 2/3.S/A.IND-help-3SG.A>3.O Melljo.ABS

kali-k pismo-n
write-INF letter-ABS.SG
'Hewngyto helped Melljo write the letter.'

c. ʔewŋəto-na-k ∅-wiɲɲen-nin meʌʌo-na-ŋ
Hewngyto-OBL.SG-ERG 2/3.S/A.IND-help-3SG.A>3.O Melljo-OBL.SG-DAT

kali-k pismo-n
write-INF letter-ABS.SG
'Hewngyto helped Melljo write the letter.'

(289) a. *jənnə$_i$ ʔewŋəto ∅-wiɲɲen-nin
what.ABS.SG Hewngyto.ABS 2/3.S/A.IND-help-3SG.A>3.O

meʌʌo-na-ŋ kali-k t$_i$
Melljo-OBL.SG-DAT write-INF
intended: 'What did Hewngyto help Melljo write?'

b. *jənnə$_i$ ʔewŋəto-na-k ∅-wiɲɲen-nin
what.ABS.SG Hewngyto-OBL.SG-ERG 2/3.S/A.IND-help-3SG.A>3.O

meʌʌo kali-k t$_i$
Melljo.ABS.SG write-INF

[46]The ergative-dative case frame of the matrix verb in (288c) at first appears to violate the dative agreement generalization discussed in §4.3.2, as we find there an agreed-with dative that does not have an absolutive co-argument. In fact, for most speakers, this is only a possibility if the complement of 'help' is transitive. When it is intransitive, as in (1), only the absolutive-dative and ergative-absolutive case frames are permitted, showing that the presence of a lower absolutive noun is in fact necessary for an agreeing dative.

(1) a. ɣəmmo t-ə-ku-wiɲɲet-ə-ŋ kəmeŋ-ə-ŋ kemetʔa-jp-ə-k
1SG.ABS 1SG.S/A-EP-PRS-help-EP-PRS child-EP-DAT clothes-put.on-EP-INF
'I am helping the child get dressed.'

b. ɣəm-nan t-ə-ku-wiɲɲeɲ-ŋ-ə-n kəmiŋ-ə-n kemetʔa-jp-ə-k
1SG-ERG 1SG.S/A-EP-PRS-help-PRS-EP-3SG.O child-EP-ABS.SG clothes-put.on-EP-INF
'I am helping the child get dressed.'

c. *ɣəm-nan t-ə-ku-wiɲɲeɲ-ŋ-ə-n kəmeŋ-ə-ŋ kemetʔa-jp-ə-k
1SG-ERG 1SG.S/A-EP-PRS-help-PRS-EP-3SG.O child-EP-DAT clothes-put.on-EP-INF
intended: 'I am helping the child get dressed.'

intended: ‘What did Hewngyto help Melljo write?’

c. jənnə$_i$ ʔewŋəto-na-k ∅-wiɲɲen-nin
what.ABS.SG Hewngyto-OBL.SG-ERG 2/3.S/A.IND-help-3SG.A>3.O

meʎʎo-na-ŋ kali-k t$_i$
Melljo-OBL.SG-DAT write-INF
‘What did Hewngyto help Melljo write?’

We might wonder whether what is in play here is not movement-triggered dependent case, but instead a relationship between the case borne by the subject of a control verb and the islandhood of the complement of that verb. However, such an approach would be in the unenviable position of having to countenance a type of island that banned movement of absolutive nominals out of itself, but allowed movement of seemingly any other elements: in (290), we see that a dative-marked nominal can be *wh*-moved across ‘help’ when it has an ergative-absolutive case frame, in (291) we see that a locative-marked noun phrase can be moved across it when it has an absolutive-dative case frame, and in (292) we see that the *wh*-verb *jeq-* ‘do what?’ can be moved across it when it has either an ergative-absolutive or an absolutive-dative case frame.

(290) mek-ə-na-ŋ$_i$ ɣəmək-ʔət-a ne-wiɲɲet-ɣəm ɣəmmo jet-ə-k t$_i$
who-EP-OBL.SG-DAT 1SG.POSS-dog-ERG INV-help-1SG.O 1SG.ABS come-EP-INF

‘Whose house (lit. who) did my dogs help me go to?’

(291) jaq-tetradj-ə-k$_i$ ɣə͡tɕ͡tɕi ∅-wiɲɲet-i qojalqot-ə-na-ŋ
which-notebook-EP-LOC 2SG.ABS 2/3.S/A.IND-help-AOR Qojalqot-EP-OBL.SG-DAT

kali-k tajkəjo-n t$_i$
write-INF exercise-ABS.SG
‘Which notebook did you help Qojalqot write the exercise in?’

(292) a. jeq-ə-k$_i$ ʔewŋəto-na-k ∅-wiɲɲen-nin
do.what-EP-INF Hewngyto-OBL.SG-ERG 2/3.S/A.IND-help-3SG.A>3.O

meʎʎo t$_i$
Melljo.ABS.SG
‘What did Hewngyto help Melljo do?’

b. jeq-ə-k$_i$ ʔewŋəto ∅-wiɲɲet-i meʎʎo-na-ŋ
do.what-EP-INF Hewngyto.ABS.SG 2/3.S/A.IND-help-AOR Melljo-OBL.SG-DAT

t$_i$

‘What did Hewngyto help Melljo do?’

The approach developed in this chapter suffices to account for the case-frame restrictions on *wh*-movement without recourse to case-sensitive islands: instead of certain case

frames banning the extraction of absolutives from the complement of 'help', all case frames allow such extraction, but the cases borne by the arguments can change over the course of the derivation due to dependent case interactions with the moving element. The structure that gives rise to the declarative sentence in (288a) is given in (293). Note that in (288a), the dative does not trigger agreement, which indicates that it is either lexical or inherent, and therefore present upon merger of the object.

(293) a. [$_{CP}$ [C_{wh} H. [$_{vP}$ [v [$_{VP}$ M.$_{DAT}$ [help [$_{CP}$ [C [PRO [$_{vP}$ [v [$_{VP}$ write letter]]]]]]]]]]]

b. [$_{CP}$ [C_{wh} H. [$_{vP}$ [v [$_{VP}$ M.$_{DAT}$ [help [$_{CP}$ [C [PRO$_{ERG}$ [$_{vP}$ letter [v [$_{VP}$ write _]]]]]]]]]]]

The derivation sketched in (294) shows how the ergative-dative case frame in (289c) can arise from the configuration that produces (288a). After moving to the embedded [Spec,vP] and triggering ergative on the subject (294b), the *wh*-word moves to the specifier of the embedded CP (294c). Here, unlike in previous derivations we have seen, no dependent case interaction takes place, as the object of 'help' already has an inherent/lexical dative. From there, the *wh*-word moves to the specifier of the matrix vP, where it triggers ergative on the matrix subject (294d), and subsequently, case-inertly, to the specifier of the matrix CP (294e).

(294) a. [$_{CP}$ [C_{wh} H. [$_{vP}$ [v [$_{VP}$ M.$_{DAT}$ [help [$_{CP}$ [C [PRO [$_{vP}$ [v [$_{VP}$ write what]]]]]]]]]]]

b. [$_{CP}$ [C_{wh} H. [$_{vP}$ [v [$_{VP}$ M.$_{DAT}$ [help [$_{CP}$ [C [PRO$_{ERG}$ [$_{vP}$ what [v [$_{VP}$ write _]]]]]]]]]]]

c. [$_{CP}$ [C_{wh} H. [$_{vP}$ [v [$_{VP}$ M.$_{DAT}$ [help [$_{CP}$ what [C [PRO$_{ERG}$ [$_{vP}$ _ [v [$_{VP}$ write _]]]]]]]]]]]

d. [$_{CP}$ [C_{wh} H.$_{ERG}$ [$_{vP}$ what [v [$_{VP}$ M.$_{DAT}$ [help [$_{CP}$ _ [C [PRO$_{ERG}$ [$_{vP}$ _ [v [$_{VP}$ write _]]]]]]]]]]]

e. [$_{CP}$ what [C_{wh} H.$_{ERG}$ [$_{vP}$ _ [v [$_{VP}$ M.$_{DAT}$ [help [$_{CP}$ _ [C [PRO$_{ERG}$ [$_{vP}$ _ [v [$_{VP}$ write _]]]]]]]]]]]

The structure that gives rise to the declarative sentence in (288b), where 'help' takes an ergative-absolutive case frame, is schematized in (295). Here, both objects move to

their respective CPs to trigger ergative on their respective subjects.[47]

(295) a. [$_{CP}$ [C_{wh} H. [$_{vP}$ [v [$_{VP}$ M. [help [$_{CP}$ [C [PRO [$_{vP}$ [v [$_{VP}$ write letter]]]]]]]]]]

domain of ERG *domain of DAT* *domain of ERG* *domain of DAT*

b. [$_{CP}$ [C_{wh} H. [$_{vP}$ [v [$_{VP}$ M. [help [$_{CP}$ [C [PRO_{ERG} [$_{vP}$ letter [v [$_{VP}$ write _]]]]]]]]]]

domain of ERG *domain of DAT* *domain of ERG* *domain of DAT*

c. [$_{CP}$ [C_{wh} $H._{ERG}$ [$_{vP}$ M. [v [$_{VP}$ _ [help [$_{CP}$ [C [PRO_{ERG} [$_{vP}$ [v [$_{VP}$ write letter]]]]]]]]]]

domain of ERG *domain of DAT* *domain of ERG* *domain of DAT*

In (296), we can see how the derivation of the sentence in (289c) proceeds from the same initial structure. The *wh*-word first moves to the specifier of the embedded vP (296b), and from there to the specifier of the embedded CP (296c), where it triggers dependent dative on the matrix object. From there, it moves to the matrix vP (296d), triggering ergative on the matrix subject, and subsequently to the matrix [Spec,CP] (296e).[48]

(296) a. [$_{CP}$ [C_{wh} H. [$_{vP}$ [v [$_{VP}$ M. [help [$_{CP}$ [C [PRO [$_{vP}$ [v [$_{VP}$ write what]]]]]]]]]]

domain of ERG *domain of DAT* *domain of ERG* *domain of DAT*

b. [$_{CP}$ [C_{wh} H. [$_{vP}$ [v [$_{VP}$ M. [help [$_{CP}$ [C [PRO_{ERG} [$_{vP}$ what [v [$_{VP}$ write _]]]]]]]]]]

domain of ERG *domain of DAT* *domain of ERG* *domain of DAT*

c. [$_{CP}$ [C_{wh} H. [$_{vP}$ [v [$_{VP}$ $M._{DAT}$ [help [$_{CP}$ what [C [PRO_{ERG} [$_{vP}$ _ [v [$_{VP}$ write _]]]]]]]]]]

domain of ERG *domain of DAT* *domain of ERG* *domain of DAT*

d. [$_{CP}$ [C_{wh} $H._{ERG}$ [$_{vP}$ what [v [$_{VP}$ $M._{DAT}$ [help [$_{CP}$ _ [C [PRO_{ERG} [$_{vP}$ _ [v [$_{VP}$ write _]]]]]]]]]]

domain of ERG *domain of DAT* *domain of ERG* *domain of DAT*

e. [$_{CP}$ what [C_{wh} $H._{ERG}$ [$_{vP}$ _ [v [$_{VP}$ $M._{DAT}$ [help [$_{CP}$ _ [C [PRO_{ERG} [$_{vP}$ _ [v [$_{VP}$ write _]]]]]]]]]]

4.7.2 A Comparison to Other Approaches

One of fundamental aspects of the dependent case system is that dependent case only arises when neither of the two nominals that are in the same case domain has already been assigned case. This correctly predicts the fact that the subjects of verbs that take a non-absolutive complement are never marked ergative, as shown above in (224-225).

[47] We might wonder whether any of the case frames for 'help' instantiates a raising-to-object structure rather than the object control structure I have represented here. This is in principle possible: I have yet to find syntactic diagnostics that are able to distinguish raising from control in Koryak. If it is raising, either that raising must occur prior to movement of the object out of the VP, so that the raised nominal does not get assigned ergative case, or the case on the raised element must be able to be overwritten when it moves into the matrix clause.

[48] The same caveat mentioned in footnote 43 applies here: it is necessary for the moving *wh*-word to already be in the embedded [Spec,CP] when material from the higher clause merges, in order to prevent the matrix object from moving out of the VP, and thus becoming ineligible for dependent dative.

We have seen in (267-268) and (290-292) that the movement of non-absolutives across an absolutive noun phrase does not have the same effect. This provides evidence against a possible counterproposal inspired by Rackowski and Richards (2005), who argue on the basis of data from Tagalog that extraction out of a phase requires agreement with that phase as an 'unlocking' mechanism. Given that CPs do not generally trigger object agreement, as seen by the fact that verbs like *valom-* 'hear' can take intransitive agreement when they have a CP complement, this account would have the CP be nominalized just in case long-distance extraction took place out of it so as to be an acceptable target for agreement. This nominalized CP would then be the case competitor for the other arguments in the clause. The fact that the case interactions are sensitive to the case of the moving element shows that this cannot be right, as the case of the moving element has no reason to interact with whether or not (or how) the clause is unlocked. Furthermore, the claim that the clause must be agreed with runs into the immediate problem that, as we saw in (245) and (246a), repeated below as (297a) and (297b), the matrix verb actually agrees with the moving *wh*-word.

(297) a. jej-u$_i$ {ɣə-nan / *ɣə͡tɕ͡tɕi} ∅-valom-na-w, əno
what-ABS.PL {2SG-ERG / *2SG.ABS} 2/3.S/A.IND-hear-3.O-3PL that

ʔewŋəto-na-k ∅-j-ə-t͡ɕim-aw-nin t_i
Hewngyto-OBL.SG-ERG 2/3.S/A.IND-CAUS-EP-break-VBLZ-3SG.A>3.O
'What all did you hear that Hewngyto broke?'

b. jej-i$_i$ {ɣə-nan / *ɣə͡tɕ͡tɕi} ∅-valom-na-t,
what-ABS.DU {2SG-ERG / *2SG.ABS} 2/3.S/A.IND-hear-3.O-3DU

əno ʔewŋəto-na-k
that Hewngyto-OBL.SG-ERG

∅-j-ə-t͡ɕim-aw-nin t_i
2/3.S/A.IND-CAUS-EP-break-VBLZ-3SG.A>3.O
'What two things did you hear that Hewngyto broke?'

Another account of the distribution of ergative case is the one advanced in Deal (2010). This proposal involves neither dependent nor inherent case. Instead, ergative case is taken to be the expression on a nominal of both subject and object agreement, the former from T and the latter from v. This approach accounts for a variety of facts of Nez Perce (including ones seemingly unrelated to case marking), and is initially appealing for Koryak too. Specifically, absolutive and ergative nouns are targetable for agreement in Koryak, and the environments where *wh*-movement triggers new dependent cases , it faces difficulty with those of Koryak. In particular, as the sentences in (298-299), repeated from (220a), (217e), and (222b) above, show, ergative marking on transitive subjects can occur in the absence of subject agreement (298), as well as in the absence of any agreement at all (299).

(298) jənnə = qi ɣəm-nan ɣa-jto-len-∅? -
what.ABS.SG = the.heck 1SG-ERG UW.PST-take.out-3.UW.PST-SG

ɣ-iw-lin-∅ jewjew
UW.PST-say-3.UW.PST-SG partridge.ABS.SG
"'What the heck did I give birth to?" said the partridge.' (Vdovin and Jajletkan 1949, 34)

(299) a. ju-kkə ɣəm-nan əməŋ ʔəvənʔ-u, əlləʔ-a
eat-PST.CVB 1SG-ERG all berry-ABS.PL mother-ERG

∅-ena-kətʔajŋa-j
2/3.S/A.IND-1SG.O-scold-AOR
'After I ate all the berries, my mother scolded me.'

b. jemɣəmɣ-ə-ɣəjŋ-ə-n ta-ɣəjŋi-ŋ-ə-lʔ-a
fear-EP-NMLZ-EP-ABS.SG MAKE-beast-MAKE-EP-S/O.PTCP-ERG

jətʔ-et-ə-k ʔeɣ-ə-lŋ-ə-n təla-ma
encounter-VBLZ-EP-INF wolf-EP-SNGL-EP-ABS.SG walk-CVB.PRS

umk-ə-k
forest-EP-LOC
'It's scary for a hunter to encounter a wolf while walking in the woods.'

Accounting for these facts on an inherent theory of ergative and dative case would also not be possible.[49] The primary insight of inherent case theory is that there is a relationship between the thematic role a noun is assigned and the case-marking that it bears. There is no way that this can be reconciled with this chapter's primary empirical contribution, that the case that a noun bears is in part dependent on the case marking of the noun phrases that came to be local to it over the course of the derivation. At best, an inherent analysis of these cases would have to be supplemented with a component that duplicates the analysis presented here, conceding the point that dependent case is a necessary mechanism for accounting for the distribution of morphological case.

4.7.3 Case and (Successive-Cyclic) A'-Movement Crosslinguistically

An obvious question that this analysis raises that I have thus far left unaddressed concerns the seeming rarity of the phenomenon discussed here: if Universal Grammar permits dependent case competition to be triggered at every step along a nominal's movement chain, why has this not been noticed before? After all, case-marking and A'-movement are among the most widely-studied syntactic phenomena; we would expect similar facts to have already been brought to light.

[49] Note that here I restrict my attention to the agreed-with datives, as I assume that dative-marked applicativized noun phrases (239b), for example, are assigned an inherent case.

It is worth noting that the proposal I advance is not intended to apply to all languages, so it may be that whatever allows a language to have dependent case triggered by successive-cyclic movement is quite rare. As an example of a language where these two do not interact, consider the Russian facts in (304). Here, the movement of a nominative *wh*-word from the embedded into the matrix clause results in them both remaining nominative.[50] Were dependent case triggered by moving a caseless noun phrase into same case domain as the matrix subject, we would expect one of the two noun phrases (presumably the lower one), to bear accusative case, contrary to fact.

(300) a. ja dumaju, čto Vasja živët v ètom dome.
I.NOM think.1SG.PRS that Vasya live.3SG.PRS in.this.house
'I think that Vasya lives in this house.'

b. {kto / *kogo} {ty / *tebja} dumaeš _
who.NOM / who.ACC you.NOM / you.ACC think.2SG.PRS
živët v ètom dome?
live.3SG.PRS in.this.house
'Who do you think lives in this house?'

Although it is clear that not all languages have the interactions this chapter has discussed, patterns like the *wh*-movement-fed case assignment are not quite as rare as they may seem. There are attested cases of an A'-moving element bears case-marking it would not have, had that movement not taken place. For example, in Hungarian, when a focused noun phrase moves out of an embedded clause across a verb that can take a nominal complement, the focused noun phrase gets the case that would be assigned to the nominal complement of the verb it is moving across. We see this with accusative and sublative in (301). Furthermore, É. Kiss (1987, 140) reports that non-nominatives do not get their case overwritten when focus-moving cross-clausally.[51] If accusative in Hungarian is a dependent case, and nominative is the absence of case, then the sentence in (301a) can be seen as the accusative-language-counterpart of the Koryak facts we have seen: a caseless noun gets assigned dependent (accusative) case at an intermediate step of movement (the embedded [Spec,CP]) where it is c-commanded by another caseless noun.[52]

(301) a. Péter-{t/*∅} mondtam, hogy jön.
Peter-{ACC/*NOM} say.1SG.PST COMP come.3SG
'It was Peter I said would come.' Eszter Ronai, p.c., based on Coppock (2004)

[50] Note the *that-trace* effect in (300b), which is unacceptable with an overt complementizer.

[51] While É. Kiss reports that the overwriting of nominative case in focus-movement constructions is preferred though not required, the native-speaker-linguist of Hungarian that I consulted rejected the sentences where the nominative was not overwritten.

[52] Presumably the sublative in (301b) is a lexical case, and so would not be assigned by case competition. Rather, it is assigned to the moving element because it is sufficiently local to the verb 'think' when it is in the intermediate [Spec,CP].

b. Péter-{re/*∅} gondoltam, hogy jöhetne.
Peter-{SUBL/*NOM} think.1SG.PST COMP come.3SG.POT
'It was Peter I thought could come.' Eszter Ronai, p.c.

One variety of English, discussed in Kayne (1984), also has a pattern reminiscent of the Koryak one described in this chapter. For speakers for whom the distinction between *who* and *whom* is one of case, Kayne reports that a subject *wh*-word extracted across a predicate with a thematic subject (*say*, *tell*, *believe*) may be marked with accusative case (*whom*), while it must be nominative (*who*) if the predicate has an expletive subject (*be obvious*). If we assume that expletive subjects do not count as case competitors in English, the data shown here also fall out on an analysis where dependent case is triggered at an intermediate step of A'-movement: when the moved caseless *wh*-word is in the specifier of the intermediate CP (or possibly of the matrix vP), if it is c-commanded by a non-expletive subject, it is sufficiently local to that subject to receive dependent accusative.[53]

(302) a. %the people whom$_i$ you say / they tell me / I believe t_i are extremely bright
b. *the people whom$_i$ it is obvious t_i like you

4.8 Conclusion

In this chapter, I have described a novel pattern involving the interaction of *wh*-movement and case marking, whereby the case that a noun bears is dependent on whether or not an absolutive *wh*-word has moved past it. Specifically, a subject that would otherwise be absolutive receives ergative case, and an object that would otherwise be absolutive receives dative case. I have analyzed it by appealing two proposals, configurational case assignment and successive-cyclic movement, which have not before been argued to interact. This analysis therefore serves as a novel argument for both the existence of configurational case assignment as well as the existence of intermediate landing sites of *wh*-movement. The discussion of Hungarian and English has shown that there are patterns from other (well-studied) languages that are plausibly derived by the same interactions that I have argued are found in Koryak. Further investigation into languages that have both dependent case and long-distance movement will hopefully uncover more such cases.

[53] Yuan (2018) argues that the distribution of clause-internal object movement predicts the differing degrees of ergativity across the Eskimo-Aleut languages. In particular, she argues that the moving object is responsible for triggering ergative morphology on the subject, rather like the Koryak *wh*-movement facts. It is less clear, however, that this movement is an A'-movement like ones in Koryak and, potentially, Hungarian and English.

Chapter 5

Deconstructing Inverse Case Attraction

5.1 Introduction

Noun phrases modified by a relative clause (NPRC) in Koryak (Chukotko-Kamchatkan) have a curious property that no other noun phrases in the language systematically[1] have: under certain circumstances, they can be marked with one of two morphological cases. Consider first the sentence in (303a), where the noun phrase *inenɣəjulevətɕ͡ʔ-* 'teacher' is marked with narrative case, which contributes the meaning of the English preposition 'about'. As expected, other cases, such as ergative, are not permitted, given that the noun phrase in question is not a transitive subject. However, when the relative clause (RC) *that* t *scolded you* is adjoined to this noun phrase, it can be marked either with either narrative case or ergative case (303b). The latter of these is allowed because the gap in the relative clause is the subject of a transitive verb, a pattern known as *inverse case attraction* (ICA).[2]

[1] I say 'systematically' as there are a few verbs whose complements can be marked with either of two cases with no apparent change of meaning, such as *peŋŋ-* 'attack' in (1) below. This is by all appearances merely a lexical fact about these verbs, rather than a property of a particular syntactic position.

(1) a. kajŋ-ə-n ∅-peŋŋ-e qoja-jtəŋ
bear-EP-ABS.SG 2/3.S/A.IND-attack-AOR reindeer-ALL
'The bear attacked the reindeer.'

b. kajŋ-a ∅-peŋŋ-ə-nen qoja-ŋa
bear-ERG 2/3.S/A.IND-attack-EP-3SG.A>3.O reindeer-ABS.SG
'The bear attacked the reindeer.'

[2] This is also known as *attractio inversa*, which is used particularly by classical philologists (e.g. Probert (2015) and sources therein) and syntacticians from Russian universities (e.g. Kholodilova 2013; Privizenceva 2016). I will employ 'inverse case attraction' or 'ICA' from here on out.

(303) a. {inenɣəjulevət͡ɕʔ-ə-kjit / *inenɣəjulevət͡ɕʔ-e} *pro*$_{1du}$
{teacher-EP-NARR / *teacher-ERG} 1DU.ABS

mət͡ɕ-t͡ɕe-kət͡ɕviʎʔ-et-ə-ŋ-∅ mitiw
1NSG.S/A-FUT-talk.about-VBLZ-EP-FUT-1NSG.S/O tomorrow
'Tomorrow we two will talk about the/a teacher.'

b. [{inenɣəjulevət͡ɕʔ-ə-kjit / inenɣəjulevət͡ɕʔ-e} mikə-ne-k$_i$ t$_i$
{teacher-EP-NARR / teacher-ERG} who-OBL.SG-ERG

na-kətʔajŋa-ɣe *pro*$_{2sg}$] *pro*$_{1du}$
INV-scold-2SG.O 2SG.ABS 1DU.ABS

mət͡ɕ-t͡ɕe-kət͡ɕviʎʔ-et-ə-ŋ-∅ mitiw
1NSG.S/A-FUT-talk.about-VBLZ-EP-FUT-1NSG.S/O tomorrow
'Tomorrow we two will talk about the teacher that scolded you.'

The existence of ICA raises a few puzzles about the grammar of Koryak and other languages that have this phenomenon. First and foremost, what is it about being modified by a relative clause that allows a noun phrase to reject the case it would normally be assigned? Second, why can the head of a (by all appearances) externally-headed relative clause (EHRC) be case-marked as though it were inside of the relative clause? Finally, given that ICA occurs in a variety of unrelated languages and could be a syntactically heterogeneous phenomenon, is there a single crosslinguistically adequate analysis of ICA?

In this chapter, I investigate the syntax of noun phrases containing relative clauses (NPRC) with inverse case attraction. Starting with data from Koryak as a baseline, I argue that relative clause heads with the expected case are in a structurally different position than those with ICA: the former are outside of the relative clause, whereas the latter are inside the relative clause in its left periphery, *pace* all previous analyses of this phenomenon. As a result, the head of NPRCs with ICA are never in the same clause as the RC-external case assigner, so they cannot receive case-marking from it. This provides a solution to the first puzzle: an NPRC can have its head either outside or inside the relative clause, and in the latter case it is not eligible for external case assignment.[3] This also provides a solution to the second puzzle: relative clauses with inverse case attraction are not, in fact, externally headed, but merely appear to be so at first glance because their heads are high in the embedded left periphery. That relative clauses with inverse case attraction are a type of internally-headed relative clause (IHRC) makes the fact that they bear RC-internal case-marking unremarkable. Unexpectedly, this discovery leads to an unnoticed connection between inverse case attraction and the left-headed internally-headed relative clauses widely found in the Gur language family (Hiraiwa 2005, 2009a,b; Bodomo and Hiraiwa 2010; Hiraiwa et al. 2017; a.o). On the analysis put forward in this chapter,

[3] I use the terms 'external case' to refer to the case that the head is required to be marked with in the absence of a relative clause and 'internal case' to refer to the case assigned to the gap inside the relative clause.

languages with ICA are simply languages with Gur-like relative clauses that happen to have case-marked nouns and relative pronouns. Finally, based on a survey of other languages with ICA that finds no data incompatible with the proposal I make for Koryak, I suggest that the analysis of ICA as involving internally-headed relative clauses with heads in the left periphery is the correct analysis for this phenomenon crosslinguistically.

This analysis has implications not only for the analysis of inverse case attraction, but also for theories of relative clauses more generally. In particular, the version of the raising analysis of what are usually called externally-headed relative clauses adopted in the Antisymmetry framework proposes that the heads of these relative clauses are located not externally to the relative clause, but in its left periphery (Kayne 1994; Bianchi 1999, 2000a,b). This is exactly what I show to be the structure involved in ICA. While proponents of this analysis propose that this high left peripheral position is sufficiently close to the matrix clause for the RC head to have its case overwritten by the DP that embeds the relative clause, my analysis shows that this cannot be correct: in order for external case to be marked on the head of a relative clause, the head must be in a position above the relative CP.

The structure of the chapter is as follows. In §5.2, I lay out relevant background information on relative clause types, inverse case attraction and its analysis, and the Koryak language. In §5.3, I present the relevant data on Koryak relative clauses, arguing that they instantiate neither correlatives nor externally-headed relatives, and §5.4 presents the analysis of this data. In §5.5, I discuss some correct predictions of the analysis. §5.6 discusses relative clauses in Gur languages, which I argue involve the same structure as ICA, and §5.7 presents data from all the languages I am aware of in which ICA has been studied, none of which are incompatible with my proposal.

5.2 Background

5.2.1 Relative Clauses

Headed relative clauses can be broadly categorized into two types: externally-headed, where the head is pronounced outside of the relative clause, and internally-headed, where the head is inside the relative clause, usually in situ. Consider the Russian EHRC in (304a). As the subject of a finite verb, the head of the NPRC *ženščina* 'woman' receives nominative case, just as it would if it were not modified by a relative clause (304b). Likewise, it also triggers number and gender agreement on the matrix verb just as it does when it is not modified by a relative clause. The relative pronoun *kotoruju*, however, is marked with the accusative case assigned to the object of the verb inside the relative clause.

(304) Russian

a. [ženščina kotoruju$_i$ ja vstretil t$_i$
woman.NOM which.ACC I.NOM met.M.SG.PST

na počte] ran'še žila v ètom dome.
at.the.post.office earlier live.F.SG.PST in.this.house
'The woman that I met at the post office used to live in this house.'[4]

b. ženščina ran'še žila v ètom dome.
woman.NOM earlier live.F.SG.PST in this house
'The woman used to live in this house.'

An example of an internally-headed relative clause is in (305), from Imbabura Quechua.[5] Here, the head of the relative clause ('child') is found inside an RC-internal embedded clause and is case marked as an object of the embedded RC-internal verb, rather than as the subject of the RC-external verb. Also unlike in Russian, the relative clause has no relative pronoun reflecting the case or *phi*-features of the RC-head. In their external syntax, however, IHRCs share properties with EHRCs. For example, the Japanese IHRC in (306) is marked with accusative case, just as the unmodified object of a transitive verb would be. The Navajo IHRC in (307) is marked with the determiner *-ą́a*, which also appears on nominals. Finally, the matrix verb in the Lakhota sentence in (308) is inflected for the *phi*-features (3rd person animate plural) of the internal head of the relative clause. These facts show that, at least in some languages, IHRCs behave for the purposes of external syntax like EHRCs.

(305) Imbabura Quechua

[Marya [Juan wawa-ta riku-shka]-ta ni-shka]
Maria Juan child-ACC see-NOMINAL-ACC say-NOMINAL

llugshi-rka
leave-PAST

'The child that Maria said that Juan saw left.' Cole (1987, ex. 39)

(306) Japanese

Ken-wa [tebburu-no-ue-ni ringo-ga oiteat-ta no]-o mi-ta
Ken-TOP table-GEN-on-LOC apple-NOM put-PST COMP-ACC see-PST

'Ken saw an apple that was put on the table.' Hiraiwa (2017, ex. 41)

(307) Navajo

[4] I omit from the example sentences the commas that are used to set off relative clauses according to the punctuation norms of certain languages. For example, according to the punctuation norms of Russian, a comma should be placed after both *ženščina* and *počte*.

[5] See Hiraiwa (2017) for an overview of the syntax of IHRCs.

[[Tl’éédą́ą́ ashkii ałhą́ą́’]-ą́a] yádoołtih
last.night boy snore-DEM will.speak

‘The boy who was snoring last night will speak.’ Platero (1974, 204), as cited in Hiraiwa (2017, ex. 52)

(308) Lakhota

[Čhápa eyá wičháo k’uŋ hená] waŋwíčhablake
beaver some shoot.3PL.O ANT DEF.PL see.1SG.S > 3PL.AN.O

ló
MS

‘I saw the beavers that he had shot.’[6] Ullrich and Black Bear Jr (2016, 264)

5.2.2 Inverse Case Attraction

Relative clauses with inverse case attraction complicate the picture presented above: as mentioned in the introduction, they are characterized by a head that is marked with the case assigned by the verb inside the relative clause (as in an IHRC), but nonetheless appear to the left of the relative clause, as in an EHRC. We saw an example of this in (303b) above, where the head of the relative clause could be marked with narrative case, as it would be without the relative clause, but could also be marked with ergative case because the gap in the relative clause was a transitive subject. Another example of internal case surfacing on the head of a relative clause is in (309a), where the head of the relative clause bears the absolutive case corresponding to the subject of the verb *jəp?ajŋa-* ‘howl’ in the relative clause, though it must bear the dative case associated with the object of *t͡ɕejmev-* ‘approach’ if it is not modified by a relative clause (309b). In this sense, the relative clause with ICA behaves like IHRC.[7]

(309) Koryak

a. RC-external case: DAT, RC-internal case: NOM

[$_{XP}$ ʔeɣəlŋ-ə-n meŋin$_i$ t$_i$ ∅-ko-jəpʔajŋa-ŋ-∅
wolf-EP-ABS which.ABS 2/3.S/A.IND-PRS-howl-PRS-3.S.IND

] qəjəm *pro$_{1sg}$* m-ə-t͡ɕejm-ev-ə-k
NEG.IRR 1SG.ABS 1SG.S/A.IMP-EP-close-VBLZ-EP-1SG.S

[6] Thanks to Adam Albright for providing the glosses for the sentence.

[7] Koryak has a limited literary tradition, most of whose works were written in the 1930s. Unfortunately, I have not been able to find any instances of inverse case attraction either in Koryak written materials or in previous grammatical descriptions (Moll 1960; Zhukova 1972), and will therefore not be discussing textual examples of ICA in this chapter.Kholodilova and Privizentseva (2015) observe that ICA is found much more frequently in non-standard language varieties than in literary languages. The apparent nonappearance of ICA in Koryak written material is perhaps a reflection of this fact. The fact that (standard) Russian does not allow ICA (though see Kholodilova 2013, ex. 3) may have also had a similar effect.

'I will not approach the wolf that is howling.'

b. {ŋanen-ʔeɣəlŋ-ə-ŋ / *ŋajen ʔeɣəlŋ-ə-n}
{DIST.DEM-wolf-EP-DAT / *DIST.DEM.ABS.SG wolf-EP-ABS.SG}

qəjəm *pro*$_{1sg}$ m-ə-t͡ɕejm-ev-ə-k
NEG.IRR 1SG.ABS 1SG.S/A.IMP-EP-close-VBLZ-EP-1SG.S
'I will not approach that wolf.'

However, as expected with an EHRC, the head of the relative clause is peripheral to RC, and the triggers agreement on the matrix verb.[8] The word-order similarities between EHRCs and RCs with ICA are underscored by the fact that all languages I am aware of that allow ICA also have run-of-the-mill EHRCs, where the head of the RC gets external case. This is exemplified by the Koryak sentence in (310), which differs from the sentence in (309a) only in that the head of the relative clause bears the dative case corresponding to the internal argument of the matrix verb *t͡ɕejmev-* 'approach'. The heads in both of these sentences appear to be in the same position to the left of the (internally-)case-marked relative pronoun *meŋin* 'which', and yet one head is case-marked in line with its relationship to the matrix verb, and the other in line with its relationship to the embedded verb.

(310) RC-external case: DAT, RC-internal case: NOM

[$_{XP}$ ʔeɣəlŋ-ə-ŋ meŋin$_i$ t$_i$ ∅-ko-jəpʔajŋa-ŋ-∅]
wolf-EP-DAT which.ABS 2/3.S/A.IND-PRS-howl-PRS-3.S.IND

qəjəm *pro*$_{1sg}$ m-ə-t͡ɕejm-ev-ə-k
NEG.IRR 1SG.ABS 1SG.S/A.IMP-EP-close-VBLZ-EP-1SG.S

'I will not approach the wolf that is howling.'

Notice the way I have schematized the sentences in (309a): the entire NPRC is enclosed in brackets and assigned the label XP. As we will see in §5.2.3, one of the analyses on the market is that ICA instantiates a correlative structure, which would make the entire NPRC a CP (and would make the designation of that constituent as a *noun phrase* containing a relative clause incorrect.) I will argue against the correlative analysis of ICA, and instead argue that relative clauses headed by noun phrases both with and without ICA are DP constituents, though their surface syntax is different. For the time being, I will demarcate the NPRC from the rest of the clause with brackets labeled XP, and will update the schematization as I produce arguments for the structure instantiated by the NPRC.

[8] As the agreement on the matrix verb in the Lakhota sentence in (308) demonstrates, internally-headed relative clause structures also allow the matrix verb to agree with the head of the relative clause, so it might appear disingenuous to describe this quality as characteristic of EHRCs. However, the fact that this should be allowed with IHRCs is in and of itself a surprising fact, which analyses beginning with Cole (1987) and Williamson (1987) have made sense of by positing silent nominal structure outside of the relative clause coindexed with its head. That the matrix verb can agree in *phi*-features with the heads of both IHRCs and RCs with ICA is therefore a way in which they both behave like EHRCs.

Turning now to agreement, the sentences in (311) demonstrate that agreement with an NPRC with ICA follows the *phi*-features of the head: the singular RC head *eʎʔanak* 'woman' in (311a) triggers (unmarked) singular agreement on the matrix verb *kaŋaŋjaŋvoŋ* 'sings', whereas the plural RC head *eʎʔajək* 'women' in (311b) triggers plural agreement on the matrix verb *kaŋaŋjaŋvolaŋ* 'sing.'

(311) a. RC-external case: ABS, RC-internal case: ERG

[$_{XP}$ eʎʔa-na-k mik-ə-ne-k
woman-OBL.SG-ERG who-EP-OBL.SG-ERG

∅-ine-n-ə-kj-ev-i ɣəmmo]
2/3.S/A.IND-1SG.O-CAUS-EP-wake.up-VBLZ-AOR 1SG.ABS

metʔa-ŋ ∅-k-aŋaŋja-ŋvo-ŋ-∅
beautiful-ADV 2/3.S/A.IND-PRS-sing-HAB-PRS-3.S.IND

'The woman that woke me up sings well.'

b. RC-external case: ABS, RC-internal case: ERG

[$_{XP}$ eʎʔa-jək-∅ mik-ə-jək-∅
woman-OBL.NSG-ERG who-EP-OBL.NSG-ERG

ne-n-ə-kj-ew-ɣəm ɣəmmo] metʔa-ŋ
INV-CAUS-EP-wake.up-VBLZ-1SG.O 1SG.ABS beautiful-ADV

∅-k-aŋaŋja-ŋvo-la-ŋ-∅
2/3.S/A.IND-PRS-sing-HAB-PL-PRS-3.S.IND

'The women that woke me up sing well.'

Lest we think that the presence of a relative clause modifying a noun triggers a case free-for-all, the sentence in (312) shows that only the absolutive and ergative cases are permitted on the head of the relative clause, corresponding to the subject of an intransitive verb (the position of the NPRC) and the subject of a transitive verb (the pivot of the relative clause), respectively. However, neither the dative nor the narrative case, which are unrelated to either the syntactic position of the NPRC or the RC pivot, is permitted on the RC head.

(312) RC-external case: ABS, RC-internal case: ERG

[$_{XP}$ {ʔujemtewilʔ-ə-n / ʔujemtewilʔ-e / *ʔojamtawelʔ-ə-ŋ /
{person-EP-ABS.SG / person-ERG / *person-EP-DAT /

*ʔujemtewilʔ-ə-kjit} mikə-ne-k$_i$ t$_i$ na-kətʔajŋa-ɣe *pro$_{2sg}$*]
*person-EP-NARR} who-OBL.SG-ERG INV-scold-2SG.O 2SG.ABS

wutku ∅-ku-jun-et-ə-ŋ-∅
here 2/3.S/A.IND-PRS-live-VBLZ-EP-PRS-3.S.IND

‘The person who scolded you lives here.’

Inverse case attraction is by no means unique to Koryak. Ancient Indo-European languages like Latin provide the most famous examples of this phenomenon, like the sentence in (313), where the head of the relative clause is marked accusative despite the NPRC being the subject of the verb ‘be.’ ICA is also found in Old Georgian, the earliest attested South Caucasian language, in sentences like (314), where the RC head is marked with oblique case instead of the expected nominative. It is also found in a variety of modern languages. An example of this in Moksha, a Uralic language of western Russia, is given in (315a), where the head of the relative clause bears the dative case assigned to the goal of the RC-internal verb, as opposed to the nominative case found on the subject of the intransitive matrix verb, as in (315b).

(313) Latin, RC-external case: NOM, RC-internal case: ACC

[urb-em qu-a-m$_i$ statu-o t$_i$] vestr-a
city-ACC which-FEM-ACC build-1SG.PRS 2PL.POSS-FEM.NOM

est
be.3SG.PRS

‘The city that I am building is yours.’ Vergil, *Aeneid* book 1, line 573

(314) Old Georgian, RC-external case: NOM, RC-internal case: OBL

[sit’q’wa-ta romel-ta$_i$ get’q’wi t$_i$ tkwen]
word-OBL.PL which-OBL.PL tell.1SG.S>2.O 2PL

sul arian da t͡sxovreba
spirit.NOM.SG be.3PL.PRS and life.NOM.SG

‘The words which I tell you are spirit and life.’ John 6:63

(315) Moksha

a. RC-external case: ABS, RC-internal case: DAT

jalga-z’ə-n’d’i, kona-n’d’i$_i$ t’ɛš-n’ə-n’ kizə-n’
friend-1SG.POSS.SG-DAT which-DAT write-IPFV-PST.1SG year-GEN

per’f s’orma-t t$_i$, vandi sa-j
around letter-PL tomorrow come-NPST.3SG

‘The friend of mine to whom I wrote letters all year long is arriving tomorrow.’
(Privizenceva 2016, ex. 8)

b. {jalga-z’ə / *jalga-z’ə-n’d’i} vandi
{friend-1SG.POSS.SG / *friend-1SG.POSS.SG-DAT} tomorrow

sa-j
come-NPST.3SG
‘My friend is arriving tomorrow.’ (Mariia Privizentseva, p.c.)

A note on the term 'inverse case attraction' is in order before moving on to a review of the previous literature on this phenomenon. The use of 'inverse' here is due to a contrast drawn with a similar phenomenon called *case attraction*, whereby both the RC head and the relative pronoun inside the relative clause are marked with the case assigned to the head in the matrix clause. That is, ICA is precisely the opposite pattern from case attraction, which Koryak does not have.[9] We see evidence of this in (316): the dative case that the noun phrase gets from being the goal argument of a ditransitive cannot be realized on the relative pronoun, which must bear ergative, as the pivot of the relative clause is a transitive subject.

(316) RC-external case: DAT, RC-internal case: ERG

[	*ʔoʎa-ŋ	mek-ə-na-ŋ$_i$	t$_i$	∅-ena-kətʔajŋa-j	
	man-DAT	who-EP-OBL.SG-DAT		2/3.S/A.IND-1SG.O-scold-AOR	
pro$_{1sg}$	]	*pro$_{1sg}$*	t-ə-je-jəl-ŋ-ə-ne-w		kanpeta-w
1SG.ABS		1SG.ERG	1SG.S/A-EP-FUT-give-FUT-EP-3.O-3PL		candy-ABS.PL

intended: 'I will give candy to the man that scolded me.'

5.2.3 Previous Work on Inverse Case Attraction

The existence of ICA has long been known by philologists and grammarians of ancient Indo-European languages, having been noted at least as early as Lily and Hoole (1670).[10] However, only a small syntactic literature on it exists, most of whose analyses fall into two camps.[11] The majority view, represented by, among others, Harbert (1982); Bader and Bayer (2006); Gračanin-Yuksek (2013); Deal (2015); Privizenceva (2016) holds that inverse case attraction constructions are, at their core, externally-headed relatives to which an extra process has applied. A minority view, argued for by Bianchi (1999, 2000a), suggests that relative clauses with inverse case attraction are not externally headed, but are instead correlatives.

[9] All of the originally-studied languages where inverse case attraction has been documented also display regular case attraction, including Ancient Greek, Latin, various historical stages of German, Old English, and Nez Perce (Bianchi 1999; Deal 2016; Czypionka et al. 2018), leading Grimm (2005) to posit (incorrectly, I think) that the two kinds of attraction should receive symmetrical analyses. Among Uralic languages, Ingrian Finnish and Moksha do not allow regular case attraction (Mariia Privizentseva p.c.), while Hill Mari does (Julia Demina, p.c.). Whether the distinction between languages with both types of attraction and ones with only ICA has any broader significance is not yet clear to me.

[10] Sentences with inverse case attraction were pointed out as anomalous as early as Donatus' *Ars Maior* in the 4th century A.D, when inverse case attraction no longer seems to have been acceptable to speakers of Latin. Consequently, he, like the other Roman grammarians, took sentences with ICA to be errors (in fact, sentences with inverse case attraction appear in the *Ars Maior* in a section entitled *De Solecismo* (On Grammatical Errors).) Based on what I have found, it is not until the early-modern era that it was noticed that these so-called errors were due to the presence of a relative clause.

[11] An account of ICA drawing both on the philological and syntactic traditions is proposed in Probert (2015, ch. 7) for early Ancient Greek.

I begin with the externally-headed accounts of ICA. For Harbert (1982) and Gračanin-Yuksek (2013), the relevant difference between relative clauses with external case on the head and those with internal case on the head is that the latter has undergone a process of case transmission that proceeds from the relative pronoun to the head. This process allows the case of the head to be overwritten by he case of the relative pronoun. In a similar vein, Bader and Bayer (2006), who primarily are trying to account for instances of inverse case attraction in modern German, which they uniformly consider speech errors, argue that it is due to 'oversharing' of syntactic features between the head and the relative pronoun: given that they must in any case bear the same number and gender features, Bader and Bayer claim that ICA occurs when a speaker produces a structure that mistakenly allows all the features borne by the head and the relative pronoun to be shared. More recent work has raised a significant problem with this account. Privizenceva (2016) argues that, despite inverse case attraction involving externally-headed relative clauses, it does not involve feature sharing between the head and the relative pronoun. This is based on the fact that in Moksha, as well as in other Uralic languages, when the relativized position is governed by an element that can freely assign more than one case, mismatches between the case of the head and the relative pronoun are permitted, so long as the cases of both the head and the relative pronoun are cases that the case assigner can assign. This, Privizenceva argues, excludes an analysis whereby case is shared between the relative pronoun and the head. Instead, she suggests that there is a mechanism that allows both the relative pronoun and the head of the relative clause to be assigned case by the same clause-internal element.

A related view is proposed in Deal (2015), which accepts that relative clauses with inverse case attraction are externally headed, but does not posit any mechanism of case transmission between the relative clause and its head. There, it is argued that relative clauses with inverse case attraction are that are derived by head-raising (Kayne 1994 et. seq.) and are left-dislocated. The fact that they are derived by head raising naturally accounts for the RC-internal case on the head, and their appearance only in a left-dislocated position accounts for the fact that the case on their head is not overwritten by main-clause lexical or functional material.

The other main view is represented by Bianchi (1999, 2000a), which holds that inverse case attraction involves a correlative structure, where the head bearing inverse case case and the relative pronoun are both inside a correlative CP left-adjoined to the main clause. The fact that both the head and the relative pronoun remain inside the (cor)relative clause on this analysis straightforwardly accounts for RC-internal case appearing on the head. Further, as we will see, most (and possibly all) languages with inverse case attraction have a positional restriction on the NPRC with ICA forcing it to occur somewhere to the left of where it would be allowed to occur if it did not have ICA. Given that correlatives usually appear at the left edge of the clause whose arguments they modify, this analysis easily

captures the positional restriction found with ICA.

5.2.4 Koryak

As discussed in the previous chapter, Koryak case-marking follows an ergative pattern without splits (317). Case affixes are usually suffixes (though occasionally circumfixes), and may be preceded by an oblique marker like *-na* in (317b). The oblique marker suppletes for number (singular vs. dual-plural, henceforth 'non-singular') and is found on second declension (to use Zhukova (1972)'s term) nouns in all cases but the absolutive.[12] The sentences in (317) also shows that Koryak verbs show agreement with up to two arguments (ergative and absolutive); for the most part, subject agreement is the leftmost prefix and object agreement is the rightmost suffix on transitive verbs, whereas subject agreement involves both a prefix and a suffix (one or both of which may be null) on intransitive verbs. There is no fixed order of nouns and verbs with respect to each other: though the default order of constituents seems to be SVO (Zhukova 1984), non-quantificational nouns can come in any order with respect to each other to to or the heads in the extended verbal projection without affecting the truth conditions of the sentence.

(317) a. meʎʎo ∅-ku-le-ŋ-∅
Melljo.ABS.SG 2/3.S/A.IND-PRS-walk-PRS-3.S.IND
'Melljo is walking.'

b. meʎʎo-na-k ∅-ku-nu-ŋ-nin
Melljo-OBL.SG-ERG 2/3.S/A.IND-PRS-eat-PRS-3SG.A > 3.O
əlet͡ɕʔ-u
honeysuckle.berry-ABS.PL
'Melljo is eating honeysuckle berries.'

Koryak has a large inventory of relative constructions, including various participial relative clauses, incorporated relatives, externally headed relative clauses, light-headed relative clauses (Citko 2004), free relatives, and in-situ internally-headed relative clauses. This chapter focuses on relative clauses with external (or seemingly external) heads. The basic structure for these is exemplified in (318-319). Here, the heads of the relative clauses are the noun *metʔaʔeŋətkənpeʎʎaqtajn-* '(the area) near the beautiful little cape' and *iniji-* 'blanket', which are marked with locative case and instrumental case respectively. The relative clause follows the head (though it can be extraposed) and contains a relative pronoun, here a form of *meŋin-* 'which'[13], that is case-marked according to the position

[12] Zhukova (1972, §105) describes these suffixes as definite articles, though the speakers I have worked with do not treat them as such. In fact, there appears to be no morphosyntactic expression of definiteness or specificity in Koryak, and consequently the definiteness of noun phrases in the English translations does not reflect anything about the original sentences.

[13] The texts that these sentences were drawn from were originally published in the 1930s. In these and other

of the gap: nominative in (318), and instrumental in (319). In all other ways, relative clauses look identical to matrix clauses: their verbs have the same morphology, their case marking properties are the same, and they display the same word-order properties.

(318) o͡tɕt͡ɕa-w to milk-u
storehouse-ABS.PL and fish.drying.shed-ABS.PL

ɣa-n-təv-al-lena-w [metʔa-ʔeŋətkən-peʎʎaq-tajn-ə-k
RES.PTCP-CAUS-be-VBLZ-3.RES.PTCP-3PL beautiful-cape-DIM-APUD-EP-LOC

meŋin$_i$ t$_i$ ∅-ko-tva-ŋ-∅ mal-wajəŋqal
which.ABS.SG 2/3.S/A.IND-PRS-be-PRS-3.S.IND good-close

o͡tɕt͡ɕa-k]
storehouse-LOC
'The storehouses and fish-drying sheds were placed near the beautiful little cape, which was a bit closer to the storehouses.' Kekketyn (2018b, 6.82)

(319) na-ɲ-a͡tɕt͡ɕəʔ-aw-na-t ənnan-ajkola-k to
INV-CAUS-lie.down-VBLZ-3.O-3DU one-sleeping.hide-LOC and

n-eɲa͡tɕʔe-na-t jaqam [əjək-iniji-te meŋine-te$_i$
INV-cover-3.O-3DU immediately 3NSG.POSS-blanket-INST which-INST

jeppə ə͡tɕt͡ɕ-i kəjulʔ-et-ə-k qonpəŋ omakaŋ
still 3NSG-ABS.DU alive-VBLZ-EP-PST.CVB always together

∅-k-enejə͡tɕʔe-ŋvo-ŋ-e t$_i$]
2/3.S/A.IND-PRS-cover.oneself-HAB-PRS-3DU
'They lay down [the two who died] on one sleeping hide and immediately covered them with their blanket, which when they were still alive they always covered themselves with.' Kekketyn (2018a, 12.10)

5.3 Inverse Case Attraction in Koryak

5.3.1 Introduction

In this section, I argue for an analysis of ICA involving left-peripherally-headed internally-headed headed relative clauses. The argument for this will proceed in two steps. First, after establishing some basic morphosyntactic properties of ICA, I will argue that NPRCs with ICA are nominal, and therefore are true nominals modified by relative clauses as opposed to correlative, which are CPs. Then, I will argue that despite the head of the

texts from that period I have read, the relative pronoun is seemingly always *meŋin-* 'which'. However, most of the relative clauses that I have elicited use *meŋin-* as the relative pronoun only if the head is singular and the relativized position is assigned absolutive. Otherwise, the relative pronoun is a *wh*-word that varies with the humanness of the head: *jeq-* 'what' for nonhumans and *mek-* 'who' for humans. Modern speakers, however, sometimes use *meŋin-* as the relative pronoun outside of the absolutive (especially for inanimate heads), and in my experience accept it in grammaticality judgment tasks without hesitation in a variety of environments.

relative clause preceding the relative pronoun both when it has internal and external case, it is actually located inside of the relative clause when it has internal case, and located outside of the relative clause when it has external case.

5.3.2 RCs with ICA are not Correlatives

Having discussed some of the morphosyntactic properties of relative clauses with inverse case attraction, I will now concentrate on those aspects of their syntax that show that neither of the previous analyses of ICA found in the literature are applicable to the Koryak facts. In this subsection, I address the proposal from Bianchi (1999) and Bianchi (2000a) that relative clauses with ICA are correlatives clauses, relative structures with an adjunct CP (usually left-dislocated) containing a *wh*-element that is related[14] to a pronominal or demonstrative element in the matrix clause (Keenan 1985 et seq.) An example of a correlative structure in Hindi is given in (320) for comparison. Here, the correlative clause is bracketed and labeled 'CP', and the correlative pronoun is italicized.

(320) [$_{CP}$ jo laRkiyaaN khaRii haiN] [*ve* lambii haiN]
which girls standing be.PRS they tall be.PRS
'The girls who are standing are tall.' Dayal (1996, p. 12)

A full discussions of the differences between headed relatives and correlatives is beyond the scope of this chapter. What is instead crucial for our purposes is that correlative clauses have a cluster of properties that headed relative clauses lack because the two types of relative structures are syntactically and semantically distinct. As we will see, Koryak NPRCs with ICA systematically pattern like the latter.

Stacking

The first relevant property is that correlatives disallow stacking, unlike headed relatives (Dayal 1996; Grosu and Landman 1998; McCawley 2004). Bhatt and Pancheva (2006) argue that this is due to a semantic difference between the two relative structures: correlative clauses combine with the demonstrative/pronoun in the main clause by binding it, whereas headed relatives combine with their heads by set intersection. The stacking restriction falls out from this because a variable can only be bound once, whereas set intersection can occur any number of times. As shown in (321a-321b), NPRCs with inverse case attraction allow stacked relative clauses, just as relative clauses whose heads bear external case do. Additionally, as the unacceptability of dative case on the head in (321b) shows, the internal case that the head is marked with must be that of the linearly first relative

[14] What exactly the nature of that relation is syntactically is debated, and the answer can vary both between and within languages (Bhatt 2003; Cable 2009). It is generally accepted that semantically this relationship is one of variable binding by the correlative clause.

clause, a fact that will become relevant in §5.4. The existence of stacked relatives in ICA provides a first argument against Bianchi's proposal that RCs with ICA are correlatives.

(321) a. RC-external case: ABS, RC_1-internal case: ERG, RC_2-internal case: ERG

[$_{XP}$ ŋavət͡ɕŋ-a [$_{YP_1}$ mik-ə-ne-k$_i$ t$_i$
woman-ERG who-EP-OBL.SG-ERG

∅-en-aɲja-j *pro$_{1sg}$*] [$_{YP_2}$ mik-ə-ne-k$_j$
2/3.S/A.IND-1SG.O-praise-AOR 1SG.ABS who-EP-OBL.SG-ERG

t$_j$ ɣət͡ɕt͡ɕi na-ja-kət?ajŋa-ɣe]] wutku
2SG.ABS INV-FUT-scold-2SG.O here

∅-ku-jun-et-ə-ŋ-∅
2/3.S/A.IND-PRS-live-VBLZ-EP-PRS-3.S.IND

'The woman who praised me who will scold you lives here.'

b. RC-external case: ABS, RC_1-internal case: INST, RC_2-internal case: DAT

[$_{XP}$ {pit͡ɕɣ-ə-n / pit͡ɕɣ-e / *pet͡ɕɣ-ə-ŋ} [$_{YP_1}$
{food-EP-ABS.SG / food-INST / *food-EP-DAT}

jeq-e$_i$ *pro$_{1sg}$* t-ewji-k t$_i$] [$_{YP_2}$ jaq-ə-ŋ$_j$
what-INST 1SG.ABS 1SG.S/A-eat-1SG.S what-EP-DAT

ɣə-nan ∅-ineɣej-ə-n t͡ɕoʎt͡ɕoʎ t$_j$]]
2SG-ERG 2/3.S/A.IND-add-EP-3(SG).O salt.ABS.SG

n-ə-mel-qin
ADJ-EP-good-ADJ.SG

'The food that I ate that you added salt to is tasty.'

Non-restrictive Modification

It has been widely reported since Dayal (1996) that correlatives clauses must be restrictive.[15] This also follows from their variable-binding semantics, because the head of a non-restrictive relative clause denotes an individual and cannot be bound. If inverse case attraction involves a correlative clause, we predict that it should disallow non-restrictive relative clauses. The sentences in (322a-322b) belie this prediction. In these sentences, a relative clause modifies a proper name (322a) or a noun phrase that denotes a unique

[15] A reported exception to this is found in Marathi, which has been claimed to allow non-restrictive correlatives (Gupte 1975; Pandharipande 1997), as shown in (1):

(1) gānd^{h}i-nni jā-nnā guru mānale te gok^{h}ale mawāl hote
Gandhi-INST REL-to teacher regarded that Gokhale moderate was
'Gokhale, whom Gandhi regarded as his teacher, was a moderate.' Gupte (1975, 77), Kinjal Joshi, p.c.

individual (322b), and the head of this relative clause can bear either the external case (absolutive in (322a) and narrative in (322b)), or the internal case (ergative in both).[16] The latter sentence also has stacked relative clauses, which provides further support against the correlative analysis.[17]

(322) a. RC-external case: ABS, RC-internal case: ERG

[$_{XP}$ {ʎenin / ʎenin-ə-ne-k} mikə-ne-k$_i$ t$_i$
{Lenin.ABS.SG / Lenin-EP-OBL.SG-ERG} who-OBL.SG-ERG

∅-jəle-nin majŋ-ə-rjevoʎu͡tsia-n
2/3.S/A.IND-lead-3SG.A>3.O big-EP-revolution-ABS.SG

əmətɕ͡wiʎu-jəʔilɣ-ə-k] ∅-viʔ-i 1924 ɣivi-k
October-moon-EP-LOC 2/3.S/A.IND-die-AOR 1924 year-LOC

'Lenin, who led the Great October Revolution, died in 1924.'

b. RC-external case: NARR, RC$_1$-internal case: ERG, RC$_2$-internal case: DAT

[$_{XP}$ {mojək-ʔəlləʔ-ə-kjet / ?mojək-ʔəlləʔ-ə-na-k
{1NSG.POSS-mother-EP-NARR / 1NSG.POSS-mother-EP-OBL.SG-ERG

/ *mojək-ʔəlləʔ-ə-na-ŋ} [$_{YP_1}$ mik-ə-ne-k$_i$ t$_i$
/ *1NSG.POSS-mother-EP-OBL.SG-DAT who-EP-OBL.SG-ERG

na-n-mit-ə-tv-an-mək *pro*$_{1du}$
INV-CAUS-skilled-EP-INCH.VBLZ-VBLZ-1NSG.S/O 1DU.ABS

waŋav-at-ə-k tɕ͡awtɕ͡əva-tɕ͡ʔenaŋ] [$_{YP_2}$ mek-ə-na-ŋ$_j$
word-VBLZ-EP-INF Koryak-ADV who-EP-OBL.SG-DAT

mo͡tɕ͡ɣ-ə-nan mət-ku-jeŋ-ŋ-ə-ne-w ovoɕa-w t$_j$
1NSG-EP-ERG 1NSG.S/A-PRS-bring-PRS-EP-3.O-3PL vegetable-ABS.PL

ɣamɣa͡tɕ͡ʔəʎo]] mət-ko-waŋav-at-ə-ŋ-∅
every.day 1NSG.S/A-PRS-word-VBLZ-EP-PRS-1NSG.S/O

'We are talking about our mother, who taught us to speak Koryak, to whom we bring vegetables every day.'

Correlative Pronoun

As mentioned above, correlatives are composed of both a correlative clause and a correlative 'pronoun', a pronoun, demonstrative, or quantifier found in the main clause. However,

[16]The internal case in (322b) is degraded due to the lack of a resumptive pronoun in the matrix clause. The consultant found the sentence with ergative on the RC head fully acceptable when the 3rd person singular narrative pronoun *ənkekjit* was added, and mentioned that she preferred adding a pronoun here (and not in other sentences with ICA) because of how long this sentence is.

[17]Note that this sentence is also a counterexample to the claim that non-restrictive relative clauses cannot be stacked, which to my knowledge was first put forward in Andrews (1975). For what it's worth, the English translation of this sentence sounds perfectly acceptable to me.

if the correlative pronoun is a quantifier, it must be a universal quantifier: existential quantifiers such as numerals are not permitted in this position (Dayal 1996). The sentences in (323) show that relative clauses with ICA do not pattern like correlatives in this respect: the correlative pronoun in these cases is a numeral.[18] This is another point on which the correlative analysis of ICA fails to account for the Koryak data.

(323) a. RC-external case: ABS, RC-internal case: DAT

[$_{XP}$ ʔojamtawelʔ-ə-ŋ mek-ə-na-ŋ$_i$ *pro$_{1sg}$*
person-EP-DAT who-EP-OBL.SG-DAT 1SG.ERG

t-ə-jəl-ne-w t$_i$ kanpeta-w[19]] *pro$_{1sg}$*
1SG.S/A-EP-give-3.O-3PL candy-ABS.PL 1SG.ERG

t-ə-je-jətʔ-eɲ-ŋ-ə-ne-t ŋəje-t͡ɕɣej-i
1SG.S/A-EP-FUT-meet-VBLZ-FUT-EP-3.O-3DU two-COLL-ABS.DU

'I will meet two people that I gave candies to.'[20]

b. RC-external case: DAT, RC-internal case: ERG

[$_{XP}$ ŋanen-eʎʔa-jək-∅ mik-ə-jək-∅$_i$ t$_i$
DIST.DEM-woman-OBL.NSG-ERG who-EP-OBL.NSG-ERG

n-aŋja-ɣəm *pro$_{1sg}$*] ŋəja-t͡ɕɣaj-ə-ŋ *pro$_{1sg}$*
INV-praise-1SG.O 1SG.ABS four-COLL-EP-DAT 1SG.ERG

t-ə-je-jəl-ŋ-ə-ne-w kanpeta-w
1SG.S/A-EP-FUT-give-FUT-EP-3.O-3PL candy-ABS.PL

'I will give candy to four of the women who praised me.'

Nominal Material Above CP

The previous two diagnostics for correlativehood having concerned their variable-binding semantics, we now turn to syntactic diagnostics. Since correlatives are bare CPs, they do not allow nominal material, such as demonstratives and quantifiers, above them (Keenan 1985). Headed relatives, however, are nominal, and like noun phrases can be modified by demonstratives and quantifiers. As the examples in (324) demonstrate, relative clauses with ICA behave like headed relatives: the distal demonstrative *ŋanen-*, the numeral *ŋəjaq*

[18]It is worth noting that the numerals used here are collective numerals rather than plain ones. What exactly the contribution of the collective suffix is here is unclear to me, though it may be nothing, as collective numerals can be used as nominal modifiers seemingly identically to non-collective ones.

[19]The word for candy (usually found in the plural) will make multiple appearances throughout the examples in this chapter, with variable spelling across the sentences. It is a relatively recent borrowing from Russian [kɐnfʲɛt], and has been nativized differently by different speakers. In the plural, at least three forms are found: *kanpetaw*, *kampetaw*, and *kampeto*.

[20]One thing that it surprising about this sentence is that the relative pronoun has the oblique singular suffix, rather than oblique non-singular one (the sentence in (324b) has the same feature.) For reasons that I don't entirely understand, some speakers only optionally put plural morphology on *wh*-elements.

'four', and the quantifier *ɣemɣe-* (here *ɣamɣa-* due to vowel harmony) all can occur on the head of a relative clause with internal case. This provides a third argument against the correlative analysis of inverse case attraction in Koryak.

(324) a. RC-external case: ERG, RC-internal case: DAT

[$_{XP}$ ŋanen-ʔojamtawelʔ-ə-ŋ mek-ə-na-ŋ$_i$ *pro$_{1sg}$*
DIST.DEM-person-EP-DAT who-EP-OBL.SG-DAT 1SG.ERG

t-ə-je-jəl-ŋ-ə-ne-w kanpeta-w t$_i$]
1SG.S/A-EP-FUT-give-FUT-EP-3.O-3PL candy-ABS.PL

∅-ku-tejk-ə-ŋ-nin jaja-wwe
2/3.S/A.IND-PRS-make-EP-PRS-3SG.A>3.O house-ABS.PL

'That person to whom I gave candies builds houses.'

b. RC-external case: ERG, RC-internal case: DAT

[$_{XP}$ ŋəjaq-ʔojamtawelʔ-ə-ŋ mek-ə-na-ŋ$_i$ *pro$_{1sg}$*
four-person-EP-DAT who-EP-OBL.SG-DAT 1SG.ERG

t-ə-je-jəl-ŋ-ə-ne-w kanpeta-w t$_i$]
1SG.S/A-EP-FUT-give-FUT-EP-3.O-3PL candy-ABS.PL

ne-ku-tejk-ə-ŋ-ne-w jaja-wwe
INV-PRS-make-EP-PRS-3.O-3PL house-ABS.PL

'Four people to whom I gave candies build houses.'

c. RC-external case: ABS, RC-internal case: DAT

[$_{XP}$ ɣamɣa-ʔojamtawelʔ-ə-jək-ə-ŋ mek-ə-jək-ə-ŋ$_i$
each-person-EP-OBL.NSG-EP-DAT who-EP-OBL.NSG-EP-DAT

pro$_{1sg}$ t-ə-jəl-ne-w t$_i$ kampeta-w]
1SG.ERG 1SG.S/A-EP-give-3.O-3PL candy-ABS.PL

∅-ko-ʎajv-ə-tko-la-ŋ-∅ ɣajqə-ənək-ʔətʔ-a
2/3.S/A.IND-walk-PLACT-PL-PRS-3.S.IND COM-3SG.POSS-dog-COM

'[Each person]$_j$ that I gave candies to is walking around with {his/her}$_j$ dog.'

Interim Summary

In this subsection, I have argued that relative clauses with ICA pattern like headed relative clauses rather than correlative clauses on a variety of tests that distinguish the two structures. The conclusion, then, is that they instantiate DP structures, rather than bare CP ones. Consequently, we can rewrite the XP bracketing the NPRC with DP, both for RCs with internal and external case, as shown in (325), repeated from (303b) above.

(325) [$_{DP}$ {inenɣəjulevətɕʔ-ə-kjit / inenɣəjulevətɕʔ-e} mikə-ne-k$_i$ t$_i$
{teacher-EP-NARR / teacher-ERG} who-OBL.SG-ERG

na-kətʔajŋa-ɣe *pro$_{2sg}$*] *pro$_{1du}$*
INV-scold-2SG.O 2SG.ABS 1DU.ABS

mətɕ-tɕe-kətɕviʎʔ-et-ə-ŋ-∅ mitiw
1NSG.S/A-FUT-talk.about-VBLZ-EP-FUT-1NSG.S/O tomorrow
'Tomorrow we two will talk about the teacher that scolded you.'

5.3.3 RCs with ICA are not Externally-Headed

I have argued against a correlative analysis of inverse case attraction based on the fact that ICA structures lack multiple syntactic and semantic properties of correlatives, and instead share them with headed relative clauses. Given that the head of a relative clause with ICA is to the left of the relative clause (including the relative pronoun), it is tempting to conclude that ICA involves run-of-the-mill externally-headed relatives. However, I will show that they also have notable syntactic differences from relative clauses whose heads have external case, complicating the analytical picture. In this section, I will discuss three such differences, and will show that two of them can be accounted for by positing that the former are externally-headed, whereas the latter have their heads in the left-periphery of the relative clause. However, one of their properties, the left-edge requirement, will not be accounted for by this difference in head position. I will discuss this further in §5.4.

Extraposition

Koryak usually permits relative clause extraposition. An example from a recent newspaper article is given in (326), where the relative clause *who arrived at the finish line* is separated from *dog racers*, the noun it modifies, by the matrix verb *remained*.

(326) jatan ŋəjoq-mələlŋen [ʔətʔ-ə-lʔ-u t$_i$]
only three-five dog-EP-PTCP-ABS.PL

∅-pajotɕ-a-la-j [meŋi-w$_j$
2/3.S/A.IND-remain-VBLZ-PL-AOR which-ABS.PL

∅-pəkej-ʎa-j t$_j$ pəʎətko-nv-etəŋ jatɕvəŋtɕat-ɣəjŋ-en]$_i$
2/3.S/A.IND-arrive-PL-AOR finish-PLACE-ALL race-NMLZ-POSS

mələlŋ-ə-tɕɣaj-o ∅-pəjə-ŋt-a-la-j
five-EP-COLL-ABS.PL 2/3.S/A.IND-take.off-ANCS-VBLZ-PL-AOR

jatɕvəŋtɕat-ɣəjŋ-ə-ŋqo [21]
race-NMLZ-EP-ABL
'Only eight dog racers remained who arrived at the finish line; five [racers]

dropped out of the race.'

However, this is only possible if the head of the relative clause has the RC-external case. This is a moot point in the previous sentence, both because the internal and external case are identical (absolutive), and because the NPRC is not in the matrix left periphery. The anti-extraposition requirement is exemplified in (327a), where the internal narrative case is banned as the RC has extraposed, and in (327b), where the internal dative is banned for the same reason.

(327) a. RC-external case: ERG, RC-internal case: NARR

[$_{DP}$ {ʔoʎa-ta / *ʔoʎa-kjet} t_i] ∅-ine-jəl-i
{man-ERG / *man-NARR} 2/3.S/A.IND-1SG.O-give-AOR

ɣəmk-ə-ŋ kampeta-w [$_{CP}$ mik-əne-kjit$_j$ muj-u
1SG-EP-DAT candy-ABS.PL who-OBL.SG-NARR 1NSG-ABS.PL

mət-ko-waŋav-al-la-ŋ-∅ t_j]$_i$
1NSG.S/A-PRS-word-VBLZ-PL-PRS-1NSG.S/O

'The man that we are talking about gave me candy.'

b. RC-external case: ERG, RC-internal case: DAT

[$_{DP}$ {eʎʔa-ta / *eʎʔa-na-ŋ} t_i] a͡tɕa͡tɕɣ-o
{girl-ERG / *girl-OBL.SG-DAT} laugh-NFIN

∅-k-ine-lŋ-ə-ŋ-∅ *pro$_{1sg}$* [$_{CP}$
2/3.S/A.IND-PRS-1SG.O-consider-EP-PRS-3.S.IND 1SG.ABS

mek-na-ŋ$_j$ *pro$_{1sg}$* t-ə-jəl-ne-w t_j kanpeta-w
who-OBL.SG-DAT 1SG.ERG 1SG.S/A-EP-give-3.O-3PL candy-ABS.PL

]$_i$

'The girl that I gave candies to is laughing at me.'

A first look at this data might suggest that the head of the relative clause has to be adjcent to the relative pronoun in order for ICA to obtain. However, this is not true, as shown in (328). The sentence in (328a) differs from (327b) in two ways: first, it does not have RC extraposition, and secondly, the relative pronoun and the head are separated from each other by the RC-internal verb. Despite the nonadjacency of the head and the relative

[21] `https://fareastvip.ru/newswire/detail.php?ID=250880` accessed May 2021. Original text: *Ятан ӈыёӄмыллыӈэн г'ытг'ылг'у паёчалай, меӈию пыкейляй пылитконвэтыӈ ячвыӈчатгиӈын, мыллыӈычгаё пыйиӈталай ячвыӈчатгиӈыӈӄо*. *Novosti Dal'nego vostoka*, the newspaper this sentence is from, does not publish using the standard Koryak orthography, so the segment-to-grapheme mapping is not the one usually found in written Koryak material. The sentence as published also contains a typo independent of the nonstandard spelling: the final word should be *ячвыӈчатгиӈэн* according to the newspaper's spelling conventions. In the standard Koryak orthography, the (corrected) sentence would be *Ятан ӈыёӄмыллыӈэн г'ытг'ылг'у паёчаллай, мэнив' пыкэйляй пылытконвэтыӈ ячвыӈчатгыйӈэн, мыллыӈычгаё пыйиӈталлай ячвыӈчатгыйӈыӈӄо*.

pronoun, both the internal and the external case are permitted on RC head. Likewise, in (328b), the head of the relative clause is separated from the relative pronoun by a temporal adverbial, and ICA is still permitted.

(328) a. RC-external case: ERG, RC-internal case: DAT

[$_{DP}$ {eʎʔa-ta / eʎʔa-na-ŋ} t-ə-jəl-ne-w
{girl-ERG / girl-OBL.SG-DAT} 1SG.S/A-EP-give-3.O-3PL

pro$_{1sg}$ mek-na-ŋ kampeta-w] a͡tɕa͡tɕɣ-o
1SG.ERG who-OBL.SG-DAT candy-ABS.PL laugh-NFIN

∅-k-ine-lŋ-ə-ŋ-∅ *pro*$_{1sg}$
2/3.S/A.IND-PRS-1SG.O-consider-EP-PRS-3.S.IND 1SG.ABS

'The girl that I gave candies to is laughing at me.'

b. RC-external case: NARR[22], RC-internal case: DAT

[$_{DP}$ ŋavəta͡ɕŋ-ə-ŋ ajɣəve mek-ə-na-ŋ$_i$
woman-EP-DAT yesterday who-EP-OBL.SG-DAT

t-ə-jəl-ne-w kanpeta-w t$_i$]
1SG.S/A-EP-give-3.O-3PL candy-ABS.PL

mət-ko-kəta͡ɕveʎʔ-al-la-ŋ-∅
1NSG.S/A-PRS-discuss-VBLZ-PL-PRS-1NSG.S/O

'We are discussing the woman to whom I gave candies yesterday.'

These two facts are accounted for if the head of the relative clause is internal to it in ICA structures, and external to it in non-ICA ones. On the assumption that the entire relative clause is the target of extraposition (that is, that you can't extrapose only part of a relative clause), we derive the fact that extraposition is not possible with inverse case attraction because the head is within the target of extraposition. Fortunately, this makes no prediction about the adjacency of the head of the relative clause and the relative pronoun; as long as either 1) there is a projection between the one hosting the head and the one hosting the relative pronoun or 2) the relative pronoun does not have to move all the way to the embedded left periphery, the fact in (328) fall out. By taking ICA to involve a relative clause with a left-peripheral internal head, we therefore successfully account for the non-extraposition restriction on ICA.

Scrambling

Another argument in favor of the internally-headed analysis of ICA comes from scrambling. As the sentences in (329) show, only heads marked with internal case allow RC-internal

[22]Although most Koryak speakers I have worked with (including the speaker who provided this sentence) mark the complement of *kəta͡ɕviʎʔet-* 'discuss' with narrative case, some mark it with dative case. For the latter group, then, a sentence like (328b) would not be a clear example of ICA.

material to scramble across them. For example, in the sentence in (329a), the temporal adverbial *ajɣəve* 'yesterday' precedes the RC head but must be interpreted in the embedded clause, as the matrix clause is marked with future tense. This is only possible, however, with internal ergative case on the head; if the head has external case, the sentence is unacceptable as this forces an RC-external reading of the adverb, resulting in a contradiction. The sentence in (329b) shows something similar: the locational adjunct *əʃkolak* 'at school' can occur before the head and be interpreted inside the relative clause, but only if the head has internal case.

(329) a. RC-external case: ABS, RC-internal case: ERG

[$_{DP}$ ajɣəve {*ŋavətɕ͡ŋ-ə-n / ✓ŋavətɕ͡ŋ-a}
yesterday {*woman-EP-ABS.SG / woman-ERG}

mik-ə-ne-k$_i$ t$_i$ ∅-ena-kət?ajŋa-j *pro$_{1sg}$*]
who-EP-OBL.SG-ERG 2/3.S/A.IND-1SG.O-scold-AOR 1SG.ABS

pro$_{1sg}$ t-ə-je-lə?u-ŋ-ə-n mitiw
1SG.ERG 1SG.S/A-EP-FUT-see-FUT-EP-3(SG).O tomorrow

'Tomorrow I will see the woman that scolded me yesterday.'

b. RC-external case: ABS, RC-internal case: ERG

[$_{DP}$ əʃkola-k {*ŋavətɕ͡ŋ-ə-n / ✓ŋavətɕ͡ŋ-a}
school-LOC {*woman-EP-ABS.SG / woman-ERG}

mik-ə-ne-k$_i$ t$_i$ ∅-ena-kət?ajŋa-j *pro$_{1sg}$*]
who-EP-OBL.SG-ERG 2/3.S/A.IND-1SG.O-scold-AOR 1SG.ABS

pro$_{1sg}$ ŋajŋən t-ə-je-lə?u-ŋ-ə-n mitiw
1SG.ERG outside 1SG.S/A-EP-FUT-see-FUT-EP-3(SG).O tomorrow

'Tomorrow I will see [the woman that scolded me at school] outside.'

The fact that the head of the relative clause can be interwoven with RC-internal material only if it is marked with RC-internal case provides further evidence that relative clause heads with internal and external case have different syntactic positions. Specifically, it suggests that the head with internal case is actually part of the relative clause, whereas the head with external case is part of the matrix clause.[23]

[23]Recent work by Ivy Sichel raises another possibility for analyzing these sentences. Specifically, Sichel (2018) analyzes a class of counterexamples to the otherwise robust generalization that relative clauses are islands, such as the sentence (1), and argues that these relative clauses are derived by head-raising (Brame 1968; Schachter 1973; Kayne 1994 a.o.). What if, then, relative clauses with ICA are in fact externally-headed, but instantiate a raising derivation, which allows material to be extracted from them?

(1) This is the child$_i$ that there is [nobody who is willing to accept t$_1$]. (Kuno 1976)

The problem with this reanalysis of the scrambling data is that the type extraction from a relative clause exemplified (1) is highly restricted: the NPRC that is extracted from must be an indefinite and must be in an existential sentence. While the definiteness or specificity of a noun phrase is difficult to test with Koryak

Left Edge Requirement

The third aspect of relative clauses with ICA that sets them apart from externally-headed relatives is that the NPRC has to be left peripheral in the clause it occurs in. This is illustrated in (330): the head can only bear external case if it follows the realis high negation particle *ujŋe* (330a), another argument (330b), the verb (330c), or another NPRC with ICA (330d).[24]

(330) a. RC-external case: DAT, RC-internal case: ERG

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speakers because neither Koryak nor Russian has a morphosyntactic means of expressing it, the fact that the scrambling of adverbs can occur with proper names (2a) or noun phrases denoting unique entities (2b) shows that Koryak ICA doesn't have the indefiniteness requirement that the sentences Sichel analyzes do.

(2) a. RC-external case: ABS, RC-internal case: ERG

[$_{DP}$ 1917 ɣivi-k ʎenin-ə-ne-k mik-ə-ne-k$_i$ t$_i$
1917 year-LOC Lenin-EP-OBL.SG-ERG who-EP-OBL.SG-ERG

∅-jəle-nin majŋ-ə-revoʎut͡sija-n əmət͡ɕwiʎu-jəʔilɣ-ə-k]
2/3.S/A.IND-lead-3SG.A>3.O big-EP-revolution-ABS.SG October-moon-EP-LOC

∅-viʔ-i 1924 ɣivi-k
2/3.S/A.IND-die-AOR 1924 year-LOC

'Lenin, who led the Great October Revolution in 1917, died in 1924.'

b. RC-external case: ABS, RC-internal case: ERG

[$_{DP}$ ajɣəve ɣəmək-ʔəllәʔ-a mik-ə-ne-k$_i$ t$_i$
yesterday 1SG.POSS-mother-ERG who-EP-OBL.SG-ERG

∅-ekmin-nin qoja-tʔol] et͡ɕɣi
2/3.S/A.IND-take-3SG.A>3.O reindeer-PART.ABS.SG today

votq-ə-tve-ɣəjŋ-ə-ma
dark-EP-INCH.VBLZ-NMLZ-EP-PRS.CVB

∅-ja-ta-katʎeta-ŋ-ə-ŋ-∅
2/3.S/A.IND-FUT-make-Hamburg.steak-make-EP-FUT-3.S.IND

'My mother, who bought reindeer meat yesterday, will make Hamburg steak this evening (lit. today while it is becoming dark).'

Further, as is clear from the sentences presented so far in the chapter, there is no requirement that NPRCs with ICA be in an existential sentence. I am grateful to Mariia Privizentseva for pointing out this alternative to me.

[24]One of my consultants has pointed out that, with a significant prosodic break before it, an NPRC with ICA can be interleaved with other parts of the clause, as in (1) (without the pause, only dative is allowed on the head.) I take this noun phrase to be an appositive, and therefore to not be a part of the rest of the clause.

(1) RC-external case: DAT, RC-internal case: ERG

ɣəm-nan *(‖) [$_{DP}$ ʔətʔ-a jeq-e$_i$ ujŋe t$_i$ e-je-jɣu-ŋ-ke
1SG-ERG dog-ERG what-ERG NEG.RLS NEG-DES-bite-DES-NEG

∅-ine-nt-i *pro*$_{1sg}$] t-ə-jəl-ne-w ʔətʔəm-u
2/3.S/A.IND-1SG.O-AUX.TR-AOR 1SG.ABS 1SG.S/A-EP-give-3.O-3PL bone-ABS.PL

'I gave bones to the dog that did not try to bite me.'

ujŋe [$_{DP}$ {eʎʔa-na-ŋ / *eʎʔa-ta}
NEG.RLS {woman-OBL.SG-DAT / *woman-ERG}

mik-ə-ne-k$_i$ t$_i$ na-kətʔajŋa-ɣe *pro$_{2sg}$*] *pro$_{1sg}$*
who-EP-OBL.SG-ERG INV-scold-2SG.O 2SG.ABS 1SG.ERG

e-jəl-ke t-ə-nt-ə-ne-w kanpeta-w
NEG-give-NEG 1SG.S/A-EP-AUX.TR-EP-3.O-3PL candy-ABS.PL

'I did not give candy to the woman that scolded you.'

b. RC-external case: ERG, RC-internal case: ABS

ɣəmmo [$_{DP}$ {ʔujemtewilʔ-e / *ʔujemtewilʔ-ə-n} meŋin$_i$
1SG.ABS {person-ERG / *person-EP-ABS} REL.ABS.SG

t-ə-jətʔ-et-ə-n t$_i$]
1SG.S/A-EP-encounter-VBLZ-EP-3(SG).O]

∅-ena-kətʔajŋa-j
2/3.S/A.IND-1SG.O-scold-AOR

'The person that I encountered scolded me.'

c. RC-external case: ABS, RC-internal case: ERG

woteŋ-ɲa-k ∅-ku-jun-et-ə-ŋ-∅ [$_{DP}$
PROX.DEM-house-LOC 2/3.S/A.IND-PRS-live-VBLZ-EP-PRS-3.S.IND

{ŋavət͡ɕŋ-ə-n / *ŋavət͡ɕŋ-a} mik-ə-ne-k$_i$ t$_i$
{woman-EP-ABS / woman-ERG} who-EP-OBL.SG-ERG

na-kətʔajŋa-ɣe *pro$_{2sg}$*]
INV-scold-2SG.O 2SG.ABS

'The woman who scolded you lives in this house.'[25]

d. RC$_1$-external case: DAT, RC$_1$-internal case: ERG, RC$_2$-external case: ABS, RC$_2$-internal case: ERG

*[$_{DP_1}$ ʔoʎa-ta mikə-ne-k$_i$ t$_i$ na-kətʔajŋa-ɣe *pro$_{2sg}$*]
man-ERG who-OBL.SG-ERG INV-scold-2SG.O 2SG.ABS

[$_{DP_2}$ kali-ta meŋine-te$_j$ t$_j$
book-ERG which-ERG

∅-ine-ɲ-ɲimɣəmɣ-ev-i *pro$_{1sg}$*] *pro$_{1sg}$*
2/3.S/A.IND-1SG.O-CAUS-fear-VBLZ-AOR 1SG.ABS 1SG.ERG

t-ə-je-jəl-ŋ-ə-n mitiw
1SG.S/A-EP-FUT-give-FUT-EP-3(SG).O tomorrow

intended: 'Tomorrow I will give the book that scared me to the man that scolded you.'

[25]There are one or two speakers I have worked with who occasionally accept inverse case attraction when the NPRC with ICA is at the right edge of the sentence.

However, this does not mean that it needs to be sentence-initial: the sentences in (331) show that ICA can occur in embedded finite clauses, where the NPRC immediately follows the complementizer. It also does not always have to be clause-initial, though there is variation among speakers on this point. Many speakers allow an NPRC with ICA to follow an adjunct *wh*-word like *tite* 'when' (332a), and some also allow it to follow the irrealis negation particle *qəjəm* (332b).

(331) a. RC-external case: ABS, RC-internal case: ERG

pro$_{1sg}$ t-ə-valom-ə-k [$_{CP}$ əno [$_{DP}$ {eʎʔa /
1SG.ABS 1SG.S/A-EP-hear-EP-1SG.S that {girl.ABS.SG /

eʎʔa-ta} mikə-ne-k$_i$ t$_i$ ∅-ine-ləʔu-j *pro*$_{1sg}$
girl-ERG} who-OBL.SG-ERG 2/3.S/A.IND-1SG.O-see-AOR 1SG.ABS

] ∅-ku-jun-et-ə-ŋ-∅ qət͡ɕʔet-ə-k]
2/3.S/A.IND-PRS-live-VBLZ-EP-PRS-3.S.IND Palana-EP-LOC

'I heard that the girl that saw me lives in Palana.'

b. RC-external case: ABS, RC-internal case: ERG

pro$_{1sg}$ t-ə-ko-ɣajm-at-ə-ŋ-∅ [$_{CP}$ tit [$_{DP}$
1SG.ABS 1SG.S/A-EP-PRS-want-VBLZ-EP-PRS-1SG.S so.that

{kəmiŋ-u / kəmiŋ-ə-jək-∅} mik-ə-ne-k$_i$ t$_i$
{child-ABS.PL / child-EP-OBL.NSG-ERG} who-EP-OBL.SG-ERG

ne-nu-ne-w kanpeta-w]
INV-eat-3.O-3PL candy-ABS.PL

n-ilɣət-ew-ne-w]
3.S/A.IMP-wash.one's.face-VBLZ-3S.IMP-3PL

'I want the children who ate candy to wash their faces (lit. I want that the children who ate candy wash their faces).'

(332) a. RC-external case: ABS, RC-internal case: ERG

tite [$_{DP}$ {ʔujemtewilʔ-ə-n / ʔujemtewilʔ-e}
when {person-EP-ABS.SG / person-ERG}

mik-ə-ne-k$_i$ t$_i$ na-kətʔajŋa-ɣe *pro*$_{2sg}$]
who-EP-OBL.SG-ERG INV-scold-2SG.O 2SG.ABS

∅-jett-i qət͡ɕʔet-etəŋ?
2/3.S/A.IND-come-AOR Palana-ALL

'When did the person that scolded you come to Palana?'

b. RC-external case: DAT, RC-internal case: ERG

qəjəm [$_{DP}$ {ʔojamtawelʔ-ə-ŋ / %ʔujemtewilʔ-e}
NEG.IRR {person-EP-DAT / person-ERG}

mik-ə-ne-k$_i$ t$_i$ ∅-ena-kətʔajŋa-j *pro$_{1sg}$*]
who-EP-OBL.SG-ERG 2/3.S/A.IND-1SG.O-scold-AOR 1SG.ABS

pro$_{1sg}$ m-ə-jəl-ne-w kanpeta-w
1SG.ERG 1SG.S/A.IMP-EP-give-3.O-3PL candy-ABS.PL

'I will not give candy to the person that scolded me.'

A similar requirement is found in almost all of the languages with ICA, though, as we will see in §5.7, it varies slightly from language to language. The language where this requirement has been investigated most closely is Nez Perce, for which Deal (2016) provides both syntactic and prosodic evidence that the NPRC with ICA is generated in the left periphery of the clause as a topic left-dislocate. While this approach is initially attractive for Koryak, the NPRC with ICA does not behave syntactically either like a topic or a left-dislocate. To the first point, the pair of sentences (333) show that an NPRC with ICA can serve as the answer to a *wh*-question, a canonical focus position.[26] Likewise, the sentence in (334), repeated from (324c) above, has an NPRC with ICA modified by a quantifier. Neither focused nor quantified noun phrases can be topics, so even if this ICA involved a type of left-dislocation, it could not be *topic* left-dislocation.[27]

(333) a. meki ŋanko ∅-ku-jun-et-ə-ŋ-∅
who.ABS.SG there 2/3.S/A.IND-PRS-live-VBLZ-EP-PRS-3.S.IND
'Who lives there?'

b. RC-external case: ABS, RC-internal case: ERG

[$_{DP}$ {inenɣəjuʎevət͡ɕʔ-ə-n / inenɣəjuʎevət͡ɕʔ-e} mik-ne-k$_i$
teacher-EP-ABS.SG / teacher-ERG who-OBL.SG-ERG

t$_i$ na-kətʔajŋa-ɣe *pro$_{2sg}$*] ŋanko
INV-scold-2SG.O 2SG.ABS there

∅-ku-jun-et-ə-ŋ-∅
2/3.S/A.IND-PRS-live-VBLZ-EP-PRS-3.S.IND

'The teacher that scolded you lives there.'

(334) RC-external case: ABS, RC-internal case: DAT

[$_{DP}$ ɣamɣa-ʔojamtawelʔ-ə-jək-ə-ŋ mek-ə-jək-ə-ŋ$_i$ *pro$_{1sg}$*
each-person-EP-OBL.NSG-EP-DAT who-EP-OBL.NSG-EP-DAT 1SG.ERG

t-ə-jəl-ne-w t$_i$ kampeta-w]
1SG.S/A-EP-give-3.O-3PL candy-ABS.PL

∅-ko-ʎajv-ə-tko-la-ŋ-∅ ɣajqə-ənək-ʔətʔ-a
2/3.S/A.IND-walk-PLACT-PL-PRS-3.S.IND COM-3SG.POSS-dog-COM

[26]Interestingly, there is interspeaker variation as to whether or not a fragment answer made up of only an NPRC can have ICA or not.

[27]This does not mean that NPRCs with ICA can *never* be topics, but merely that they don't have to be.

'[Each person]$_j$ that I gave candies to is walking around with {his/her}$_j$ dog.'

As to whether it instantiates any kind of left-dislocation, the answer is unfortunately not totally clear. To show why, we first need to be clear on what we are calling left-dislocation; since Koryak allows the constituents in a sentence to appear in almost any order, it's not obvious that something like left-dislocation is identifiable as an independent phenomenon in the language. However, there is a construction in which a noun phrase has a particularly tenuous relationship with the rest of the sentence in that it lacks the case-marking associated with the position it is interpreted in. Examples of this are given in (335), where the sentence begins with an absolutive-marked noun phrase whose reference is picked up later in the sentence by an obligatory resumptive pronoun with the expected case-marking.[28] The fact that this pronoun is obligatory distinguishes this left-dislocation construction from the pattern seen with inverse case attraction, where no obligatory pronoun is found.[29] Further, left dislocation is only allowed by some speakers, whereas all speakers allow inverse case attraction. Both of these facts render impossible an analysis on which inverse case attraction requires the type of left dislocation exemplified in (335).

(335) a. % kəmiŋ-u, t-ə-jəl-ne-w *(əjk-ə-ŋ)
child-ABS.PL 1SG.S/A-EP-give-3.O-3PL *(3NSG-EP-DAT)

kampeta-w
candy-ABS.PL
'The children, I gave them candy.'

b. % t͡ɕinin-kin nute-nut, *(ənka-jtəŋ)
own-ADJ.ABS.SG land-ABS.SG *(3SG-ALL)

t-ə-k-emŋol-ə-ŋ-∅
1SG.S/A-EP-PRS-miss-EP-PRS-1SG.S
'My native land, I miss it.'

The fact that relative clauses whose heads have internal case have a positional restriction that relative clauses whose heads have the expected case do not have provides a third argument in favor of treating these two types of RC differently. This fact does not obviously fall out from an analysis that takes these relative clauses to be internally headed, nor does it constitute an argument against an internally-headed analysis. Since some sort of left-edge requirement exists in many (though not all) languages with this type of relative clause, I will argue that these must be analyzed on a language-particular basis and probably independently of the internal-headedness of relative clauses with ICA. Unlike in

[28] I use the term 'resumptive pronoun' here in a merely descriptive way; I do not mean to suggest that it is the spellout of a trace of movement, for example.

[29] There is variation among speakers as to whether or not a case-marked resumptive pronoun is allowed in cases of ICA: most find it acceptable but not ideal, though as we saw in (322b) above, some speakers prefer them when there is a lot of material between the NPRC and the position it is interpreted in.

Nez Perce, where ICA constructions are parasitic on the independently existing hanging topic left-dislocation structure, such a unification is not possible in Koryak. I will therefore suggest that no insightful synchronic analysis of the left edge requirement is yet possible given what is known about Koryak syntax, and simply posit a high functional projection in the clause that hosts the NPRC with ICA.

5.3.4 Summary

In this section, I have presented arguments showing that relative clauses with inverse case attraction are nominal. I have also presented three arguments that argue in favor of the proposal that relative clauses with inverse case attraction have a different structure from run of the mill externally-headed relative clauses. Two of these arguments support a structure where the head of the relative clause is in a position high in the left periphery of the relative clause. This results in a further modification to the bracketing of the relative clauses we have seen. Consider, for example, the sentence in (312), repeated below as (336) with the first bracketing update.

(336) RC-external case: ABS, RC-internal case: ERG

[$_{DP}$ {ʔujemtewilʔ-ə-n / ʔujemtewilʔ-e} mikə-ne-k$_i$ t$_i$
{person-EP-ABS.SG / person-ERG} who-OBL.SG-ERG

na-kətʔajŋa-ɣe *pro*$_{2sg}$] wutku
INV-scold-2SG.O 2SG.ABS here

∅-ku-jun-et-ə-ŋ-∅
2/3.S/A.IND-PRS-live-VBLZ-EP-PRS-3.S.IND

'The person who scolded you lives here.'

As argued in the previous subsection, the entire relative construction in (336) is a DP. What I have argued in this subsection is that the position of the CP boundary vis-à-vis the head differs depending on the case-marking head has. If the head has external case, the relative CP boundary is between the head and the relative pronoun, as in (337a). If, on the other hand, the head has internal case, the relative CP is outside of the head, which is located in the left periphery of the RC (337b).

(337) a. RC-external case: ABS

[$_{DP}$ ʔujemtewilʔ-ə-n [$_{CP}$ mikə-ne-k$_i$ t$_i$ na-kətʔajŋa-ɣe
person-EP-ABS.SG who-OBL.SG-ERG INV-scold-2SG.O

pro$_{2sg}$]] wutku ∅-ku-jun-et-ə-ŋ-∅
2SG.ABS here 2/3.S/A.IND-PRS-live-VBLZ-EP-PRS-3.S.IND

'The person who scolded you lives here.'

b. RC-internal case: ERG

[$_{DP}$ [$_{CP}$ ʔujemtewilʔ-e mikə-ne-k$_i$ t$_i$ na-kətʔajŋa-ɣe
person-ERG who-OBL.SG-ERG INV-scold-2SG.O

pro$_{2sg}$]] wutku ∅-ku-jun-et-ə-ŋ-∅
2SG.ABS here 2/3.S/A.IND-PRS-live-VBLZ-EP-PRS-3.S.IND

'The person who scolded you lives here.'

5.4 Putting Things Together

As outlined in the previous section, my proposal has two parts. First, I partially follow the line of analysis developed by Harbert (1982) which takes ICA to involve a headed relative clause rather than a correlative. Second, I depart from previous analyses by taking the head of the relative clause to be suface-left-peripheral inside the relative clause, whereas the Harbert analysis holds that the head is RC-external and requires an otherwise unnecessary process of case attraction otherwise. Let's see how these principles interact to derive the data presented in the previous section, beginning with the internal structure of the relative clause itself.

For relative clauses whose heads have the expected case marking, I take the internal structure of the NPRC in (338a), repeated from (337a) above, to be as in (338b). The symbol e here represents an empty category corresponding to the head of the relative clause (represented by their coindexation), and is chosen because I am agnostic as to whether they are derived by head-raising (in which case the empty category would be a movement trace) or by matching (in which case it would be a noun phrase deleted under identity with the head of the RC.) The reason for this agnosticism is that I have not been able to successfully carry out any of the tests that I am aware of that distinguish between the two derivations, and some of them (involving multiword idioms, for example) are probably impossible to test in Koryak. We see schematized in this structure that the interrogative structure containing the relative pronoun and the empty category corresponding to the head moves from its base position in [Spec,vP] into a specifier of CP the relative clause.[30]

(338) a. RC-external case: ABS

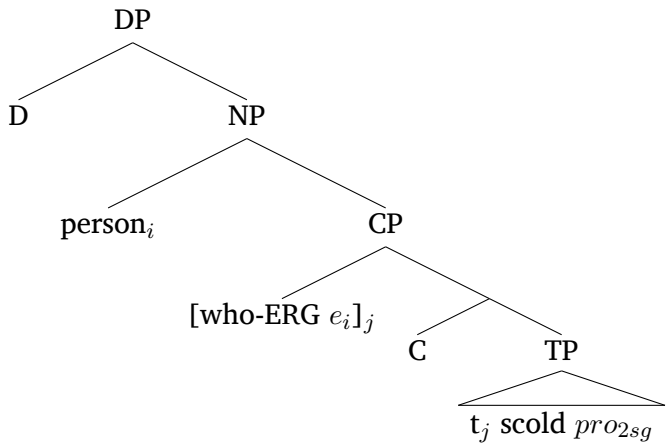
[$_{DP}$ ʔujemtewilʔ-ə-n [$_{CP}$ mikə-ne-k$_i$ t$_i$ na-kətʔajŋa-ɣe
person-EP-ABS.SG who-OBL.SG-ERG INV-scold-2SG.O

pro$_{2sg}$]] wutku ∅-ku-jun-et-ə-ŋ-∅
2SG.ABS here 2/3.S/A.IND-PRS-live-VBLZ-EP-PRS-3.S.IND

'The person who scolded you lives here.'

[30] I do not represent the movement of the subject to [Spec,TP], for which there is, at best, only weak evidence in Koryak, and which does not have an effect on the analysis.

b.



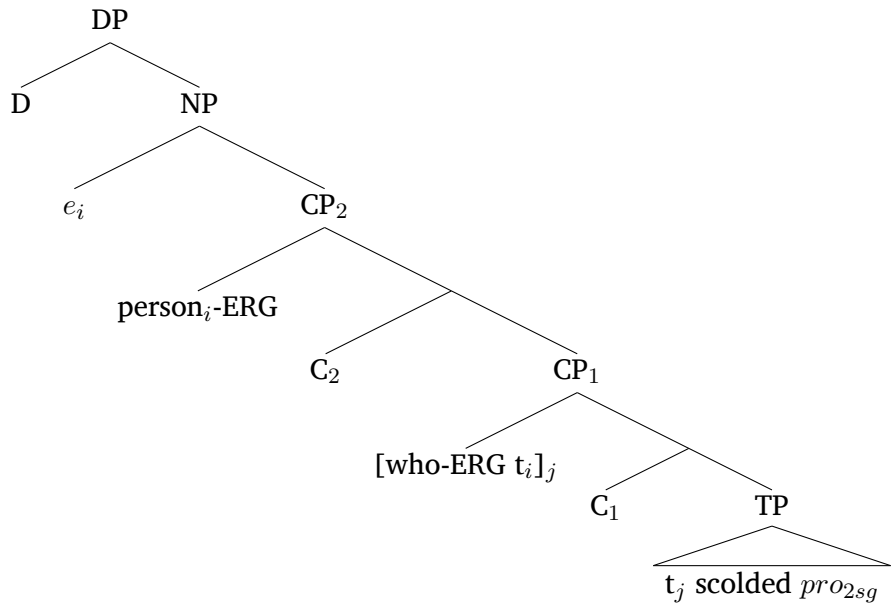
For relative clauses with inverse case attraction like (339a), repeated from (337b) above, the structure is similar, except that the head of the relative clause is generated in and remains inside the relative clause. The head moves with the relative pronoun into the specifier of the lower CP, from which it excorporates and moves into the higher one, as is standardly assumed for the raising analysis of relative clauses. The multiple-CP structure I invoke here is based on Rizzi (1997)'s Split Comp hypothesis: I refrain from labelling the various complementizer projections with more specific names (e.g. TopicP, ForceP, FocusP) because it does not have an effect on the analysis. In this instance, the empty category e is in the matrix clause.

(339) a. RC-external case: ABS, RC-internal case: ERG

[$_{DP}$	[$_{CP}$	ʔujemtewilʔ-e	mikə-ne-k$_i$	t$_i$	na-kətʔajŋa-ɣe	
		person-ERG	who-OBL.SG-ERG		INV-scold-2SG.O	
pro$_{2sg}$	]	]	wutku	∅-ku-jun-et-ə-ŋ-∅		
2SG.ABS			here	2/3.S/A.IND-PRS-live-VBLZ-EP-PRS-3.S.IND		

'The person who scolded you lives here.'

b.



Why posit that the head of the relative clause moves out of the *wh*-phrase in CP$_1$ at all? The word order is, after all, compatible with a head-final structure where no excorporation has taken place. First, determiners' default position in Koryak is before, not after, their nominal complement. Second, as we saw in (328), repeated below in (340a) material from the the relative clause can come between the head and the relative pronoun. Both of these facts suggest that the head and the relative pronoun do not form a surface constituent, showing that the head is in a higher position than the relative pronoun. The multiple CP structure used to analyze the relative position of the head and the relative pronoun allows us to analyze sentences where RC-internal material precedes the relative pronoun. For example, the structure for the relative clause in (340a), where the adverb *ajɣəve* 'yesterday' is between the head and the relative pronoun, is as in (340b), and the structure for the relative clause in (341a), where that adverb occurs to the left of the head, is as in (341b). In both of these sentences, one of the multiple CPs hosts the moved adverb.

(340) a. RC-external case: NARR, RC-internal case: DAT

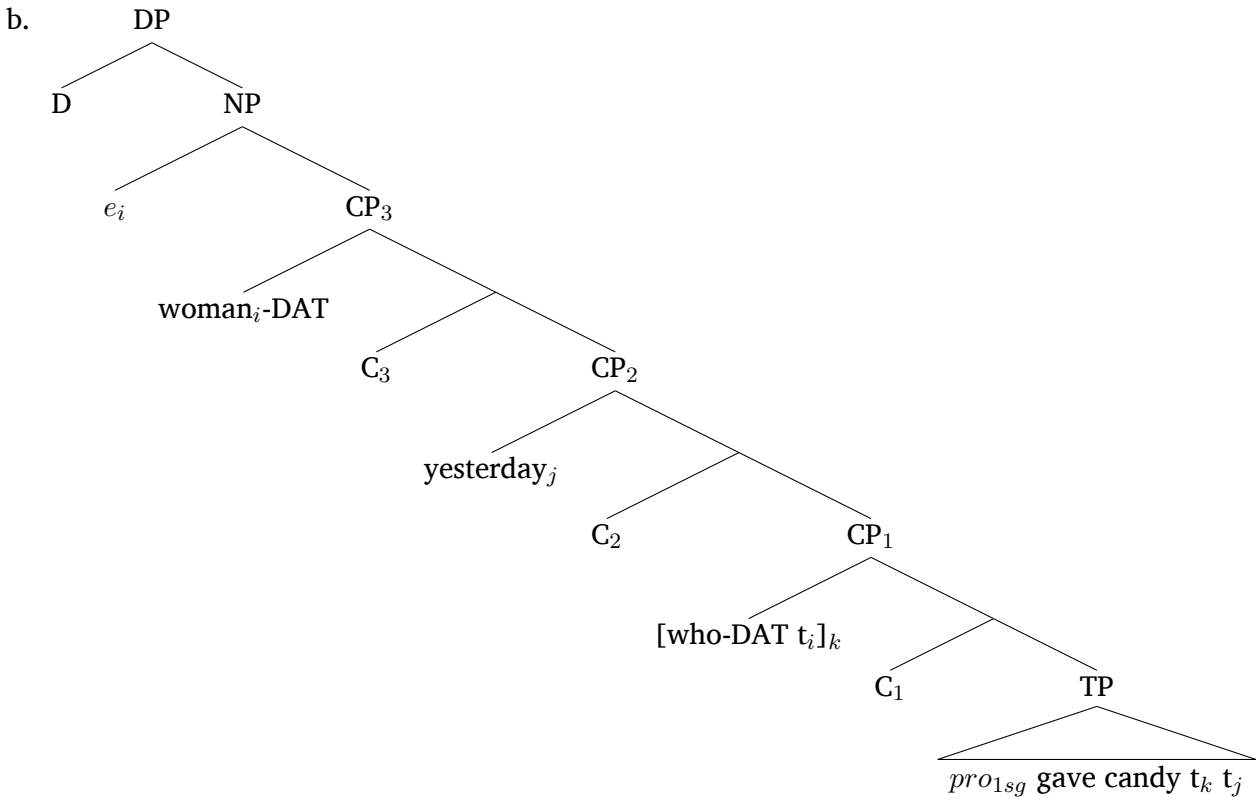
[$_{DP}$ [$_{CP}$ ŋavət͡ɕŋ-ə-ŋ ajɣəve mek-ə-na-ŋ$_k$
woman-EP-DAT yesterday who-EP-OBL.SG-DAT

t-ə-jəl-ne-w kanpeta-w t$_k$]]
1SG.S/A-EP-give-3.O-3PL candy-ABS.PL

mət-ko-kət͡ɕveʎʔ-al-la-ŋ-∅
1NSG.S/A-PRS-discuss-VBLZ-PL-PRS-1NSG.S/O

'We are discussing the woman to whom I gave candies yesterday.'

b.



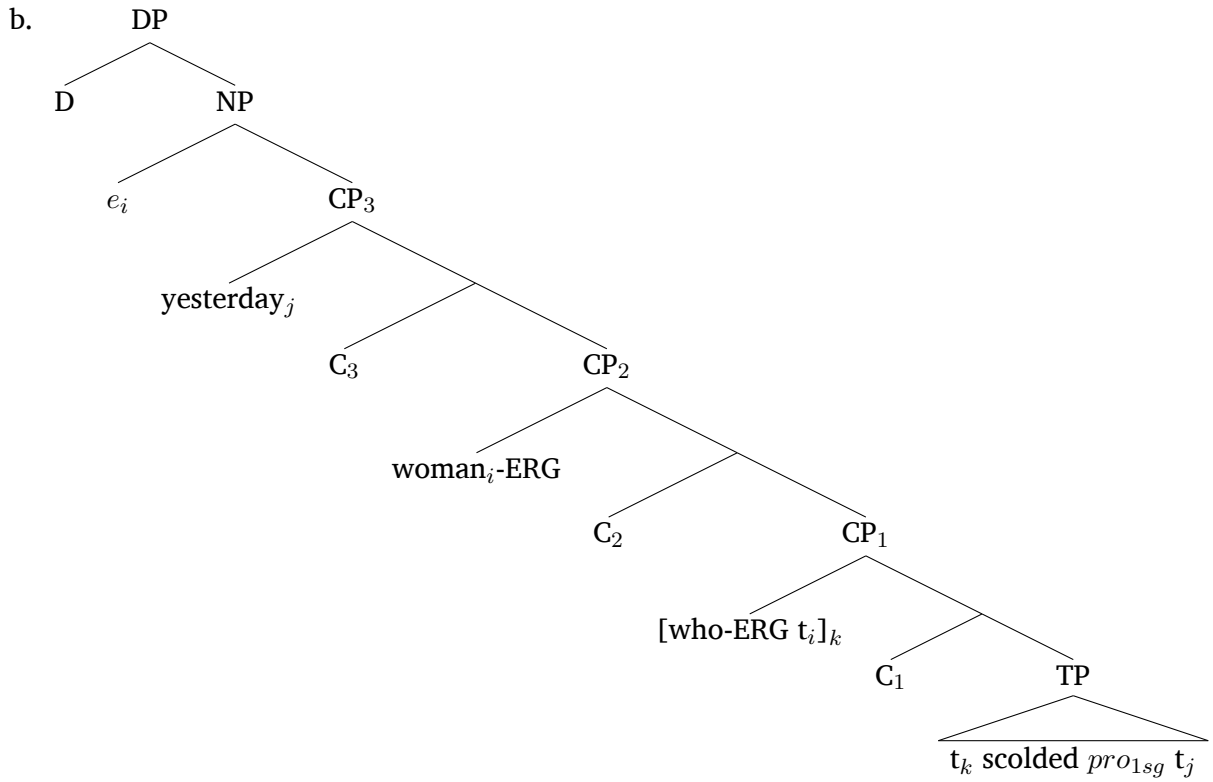
(341) a. RC-external case: ABS, RC-internal case: ERG

[$_{DP}$	[$_{CP}$	ajɣəve	ŋavət͡ɕŋ-a	mik-ə-ne-k$_i$		t$_i$
		yesterday	woman-ERG	who-EP-OBL.SG-ERG		
∅-ena-kətʔajŋa-j			*pro$_{1sg}$*	]	]	*pro$_{1sg}$*
2/3.S/A.IND-1SG.O-scold-AOR			1SG.ABS			1SG.ERG

t-ə-je-ləʔu-ŋ-ə-n mitiw
1SG.S/A-EP-FUT-see-FUT-EP-3(SG).O tomorrow

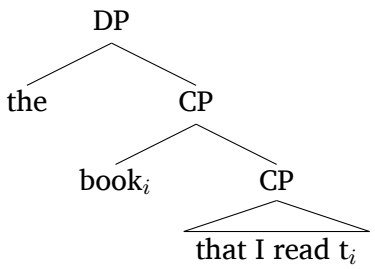
'Tomorrow I will see the woman that scolded me yesterday.'

b.



The structure sketched out for the relative clause in (341b) and (340b) have precedent in the syntactic literature: defenders of the raising analysis of externally headed relative clauses propose an identical structure for those clauses. For example, Bianchi (1999) defends the structure in (342) for the relative clause 'the book that I read' (Bianchi 1999, p. 41). What the data from Koryak (and other languages with ICA, as we will see in §5.7) shows is that this structure cannot be correct for externally-headed relatives: the head in the specifier of the relative CP is not local enough to the RC-external determiner in order to have its case overwritten by it, and instead is marked with RC-internal case.[31] Consequently, if a language allows RCs without ICA (and all languages with externally-headed relative clauses I am aware of do), it must allow a type of relative clause other than the kind represented in (342), where the head is outside of the relative CP.

(342)



[31] This does leave open the possibility that Bianchi's structure is correct for externally headed relative clauses in languages without morphological case marking on nominals, such as English or most of modern Romance.

Returning to Koryak, note that even when the relative clause is externally-headed (that is, has external case), it needs to be able to have multiple CPs, as RC-internal material can still occur to the left of the relative pronoun, as exemplified in (343a). The tree for the external case variant of this sentence is given in (343b).

(343) a. RC-external case: ERG, RC-internal case: DAT

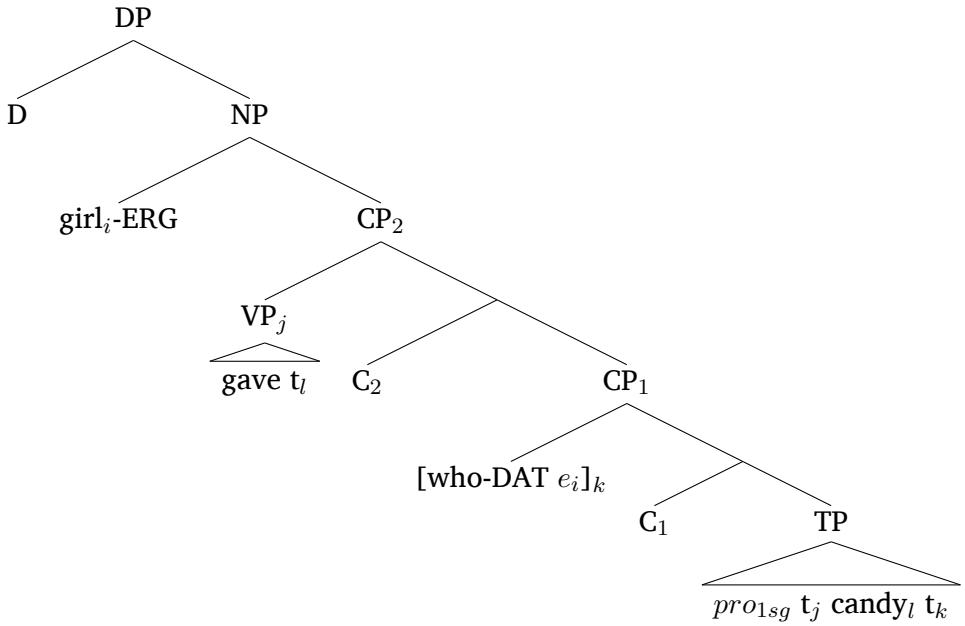
[$_{DP}$ {eʎʔa-ta / eʎʔa-na-ŋ} t-ə-jəl-ne-w
{girl-ERG / girl-OBL.SG-DAT} 1SG.S/A-EP-give-3.O-3PL

mek-na-ŋ$_k$ *pro*$_{1sg}$ kampeta-w t$_k$] a͡tɕa͡tɕɣ-o
who-OBL.SG-DAT 1SG.ERG candy-ABS.PL laugh-NFIN

∅-k-ine-lŋ-ə-ŋ-∅ *pro*$_{1sg}$
2/3.S/A.IND-PRS-1SG.O-consider-EP-PRS-3.S.IND 1SG.ABS

'The girl that I gave candies to is laughing at me.'

b.



Let's now turn to the structure of the clause containing the NPRC. Unfortunately, based on the available evidence the picture is considerably more murky. I showed in the previous section that NPRCs with ICA differ from ones with the expected case in having a left-peripherality restriction. Let's call the position that the relative clause with ICA occurs in [Spec,αP]. The position of αP within the clausal extended projection is high, though not maximally so, given that NPRCs with ICA follow complementizers and, for some speakers, certain *wh*-words and negative particles. This interspeaker variation also suggests that αP may be in different positions for different speakers, or even that its identity may vary between speakers. Given that relative clauses whose heads have external case can occur in the same position as those whose heads have internal case, [Spec,αP] can presumably

host them too. I have argued that, whatever position the NPRC with ICA is in, it is not (obligatorily) the position of topic left-dislocated elements (if there even is a single such position in Koryak).

Independently of figuring out the specific position(s) that the NPRC can be located it, we can ask how the NPRC gets into that position: is it by movement or is it base-generated there? Unfortunately, there are inconsistencies both within and across speakers regarding whether a relevant complex noun phrase can be separated from the position it is interpreted in by an island boundary (in particular, by a *wh*-island). It is therefore not possible to tell at this point whether the left peripherality of the NPRC is derived by movement or base-generation, though a better understanding of constraints on movement out of islands in Koryak might clear this up.

Clearly, more work on Koryak is necessary to be able to identify the exact relation between the NPRC and the position it is interpreted in, as well as the nature of its left-edge requirement. What αP is specifically is not known, at least in part because of how little we know about the structure of the Koryak left periphery and the relationship between word order and information structure in the language. Were more known about these aspects of the language, we might be able to determine exactly which position(s) NPRCs with ICA occur in. Understanding this would also help elucidate *why* it is that these noun phrases must appear in the left periphery of the sentence. For example, it might be that there is a limited set of information-structural roles that the NPRC with ICA can have, and all of those roles happen to be expressed by putting the relevant nominal in the left periphery of the sentence. Alternatively, there could be a prosodic requirement on internally-headed relative clauses that requires them to be in the clausal left periphery (see Richards (2016) for arguments that prosodic requirements can drive syntactic operations). Finally, the left peripheral requirement may be purely formal and therefore synchronically unmotivated, as Simpson (2004) argues for certain movement operations in a variety of Southeast Asian languages. Bianchi (1999) argues on the basis of the history of relative structures in Indo-European that relative clauses with ICA are an intermediate historical step between correlatives and standard externally-headed clauses. Since correlatives usually have a left-edge requirement, if the connection between ICA and correlatives that Bianchi proposes is correct, the left edge requirement on ICA could be the residue of these clauses' history as correlatives. I leave it to future work to resolve these issues.

5.5 Some Correct Predictions

In this section, I discuss three correct predictions of the analysis I have developed. One of them comes from the lack of effect of case marking on the availability of ICA, and the others from the distribution of cases and adverbial fronting in stacked relative clauses.

5.5.1 No Effect of Case Markedness

Phenomena involving multiple morphological cases are often sensitive to the relative markedness of those cases. For example, the Icelandic passive causes a promoted object that would otherwise be marked with accusative case to be marked with nominative (344), but famously leaves the case of promoted objects otherwise marked with genitive (345) or dative (346) case alone.

(344) a. Lögreglan tók Siggu fasta
police.DEF.NOM took Sigga.ACC fast.ACC
'The police arrested Sigga.' Zaenen et al. (1985, ex. 2a)

b. Sigga var tekin föst af lögreglunni
Sigga.NOM was taken fast.NOM by police.DEF.DAT
'Sigga was arrested by the police.' ibid. ex. 2b

(345) a. Ég hjálpaði honum
I.NOM helped him.DAT
'I helped him.' ibid. ex. 8a

b. Þeim var hjálpað
them.DAT was helped
'They were helped.' ibid. ex. 11a

(346) a. Ég mun sakna hans
I.NOM will miss him.GEN
'I will miss him.' ibid. ex. 8b

b. Hennar var saknað
her.GEN was missed
'She was missed.' ibid. ex. 11b

Direct case attraction[32] (DCA) is also sensitive to a case hierarchy: case attraction may only take place if the attracting (external) case is more marked than the expected (internal)

[32] Recall from (316) above, repeated here as (1), that direct case attraction is not allowed in Koryak with a sentence-initial NPRC. The sentence in (2) shows that this is also not possible for an in-situ noun phrase.

(1) RC-external case: DAT, RC-internal case: ERG

[*ʔoʌa-ŋ mek-ə-na-ŋ$_i$ t$_i$ ∅-ena-kətʔajŋa-j *pro$_{1sg}$*]
man-DAT who-EP-OBL.SG-DAT 2/3.S/A.IND-1SG.O-scold-AOR 1SG.ABS

pro$_{1sg}$ t-ə-je-jəl-ŋ-ə-ne-w kanpeta-w
1SG.ERG 1SG.S/A-EP-FUT-give-FUT-EP-3.O-3PL candy-ABS.PL

intended: 'I will give candy to the man that scolded me.'

(2) **pro$_{1sg}$* t-ə-je-jəl-ŋ-ə-ne-w kanpeta-w [$_{DP}$ ʔoʌa-ŋ
1SG.ERG 1SG.S/A-EP-FUT-give-FUT-EP-3.O-3PL candy-ABS.PL man-DAT

mek-ə-na-ŋ$_i$ t$_i$ ∅-ena-kətʔajŋa-j *pro$_{1sg}$*]
who-EP-OBL.SG-DAT 2/3.S/A.IND-1SG.O-scold-AOR 1SG.ABS

intended: 'I will give candy to the man that scolded me.'

case (Harbert 1982; Young 1988). Take the case hierarchy proposed in Marantz (1991), which I argued in the previous chapter is implicated in the case and agreement phenomena of Koryak. In this hierarchy, unmarked case (absolutive) is the least marked, dependent cases (ergative and certain datives) are more marked than absolutive, and lexical and oblique cases are the most marked.[33] If Koryak ICA is like direct case attraction (in the languages that have it), we predict that it should only occur when the attracting case is more marked than the expected one, that is, when the internal case is more marked than the external one. This prediction is false, as the sentences in (347), repeated from (309a) and (310) above, and (348) show. In both instances, the internal case (absolutive in (347) and ergative in (348)) is less marked than the external one (ergative in (347) and narrative in (348)), but there is no restriction on which can appear on the head. When the internal and external cases are both dependent, and therefore equally marked, inverse case attraction is also permitted, as is exemplified in (349).[34]

(347) RC-external case: DAT, RC-internal case: ABS

[$_{XP}$ {ʔeɣəlŋ-ə-ŋ / ʔeɣəlŋ-ə-n} meŋin$_i$ t$_i$
{wolf-EP-DAT / wolf-EP-ABS} which.ABS

∅-ko-jəpʔajŋa-ŋ-∅] qəjəm *pro$_{1sg}$*
2/3.S/A.IND-PRS-howl-PRS-3.S.IND NEG.IRR 1SG.ABS

m-ə-t͡ɕejm-ev-ə-k
1SG.S/A.IMP-EP-close-VBLZ-EP-1SG.S

'I will not approach the wolf that is howling.'

(348) RC-external case: NARR, RC-internal case: ERG

[$_{XP}$ {inenɣəjulevət͡ɕʔ-ə-kjit / inenɣəjulevət͡ɕʔ-e} mikə-ne-k$_i$ t$_i$
{teacher-EP-NARR / teacher-ERG} who-OBL.SG-ERG

na-kətʔajŋa-ɣe *pro$_{2sg}$*] *pro$_{1du}$*
INV-scold-2SG.O 2SG.ABS 1DU.ABS

mət͡ɕ-t͡ɕe-kət͡ɕviʎʔ-et-ə-ŋ-∅ mitiw
1NSG.S/A-FUT-talk.about-VBLZ-EP-FUT-1NSG.S/O tomorrow

'Tomorrow we will talk about the teacher that scolded you.'

(349) RC-external case: ERG, RC-internal case: DAT

[$_{XP}$ {ʔujemtewilʔ-e / ʔojamtawelʔ-ə-ŋ} mek-ə-na-ŋ$_i$ *pro$_{1sg}$*
{person-ERG / person-EP-DAT} who-EP-OBL.SG-DAT 1SG.ERG

[33] No Koryak-internal evidence that I am aware of establishes the relative markedness of lexical and oblique cases with respect to each other.

[34] See chapter 4 for arguments that ergative and the dative case found on the goal argument of *jəl-* 'give' is dependent.

t-ə-jəl-ne-w t$_i$ kampeta-w]
1SG.S/A-EP-give-3.O-3PL candy-ABS.PL

∅-aŋja-nen uvik
2/3.S/A.IND-praise-3SG.A>3.O self.ABS.SG

'The person that I gave candy to praised himself/herself.'

5.5.2 Back to Stacked Relative Clauses

Let's take another look at the stacked relative clauses, which are repeated from (321b) and (322b) above. Previously, these were used as an argument against a correlative analysis of ICA, as correlative clauses systematically disallow RC-stacking. I now want to focus on a different aspect of these sentences, namely, the fact that the evidence for RC-internality of the head only applies to the linearly first relative clause. For example, the only internal case that the head can be marked with is that of the first relative clause: instrumental (not dative) in (350a) and ergative (not dative) in (350b). Similarly, the contrast in (351) shows that the head of a relative clause can be preceded by an adverb from the linearly first relative clause ('yesterday'), but not by one from the linearly second one ('tomorrow').

(350) a. RC-external case: ABS, RC_1-internal case: INST, RC_2-internal case: DAT

[$_{DP}$ {pit͡ɕɣ-ə-n / pit͡ɕɣ-e / *pet͡ɕɣ-ə-ŋ} [$_{RC_1}$
{food-EP-ABS.SG / food-INST / *food-EP-DAT}

jeq-e$_i$ *pro$_{1sg}$* t-ewji-k t$_i$] [$_{RC_2}$ jaq-ə-ŋ$_j$
what-INST 1SG.ABS 1SG.S/A-eat-1SG.S what-EP-DAT

ɣə-nan ∅-ineɣej-ə-n t͡ɕoʎt͡ɕoʎ t$_j$]]
2SG-ERG 2/3.S/A.IND-add-EP-3(SG).O salt.ABS.SG

n-ə-mel-qin
ADJ-EP-good-ADJ.SG

'The food that I ate that you added salt to is tasty.'

b. RC-external case: NARR, RC_1-internal case: ERG, RC_2-internal case: DAT

[$_{DP}$ {mojək-ʔəllə?-ə-kjet / ?mojək-ʔəllə?-ə-na-k
{1NSG.POSS-mother-EP-NARR / 1NSG.POSS-mother-EP-OBL.SG-ERG

/ *mojək-ʔəllə?-ə-na-ŋ} [$_{RC_1}$ mik-ə-ne-k$_i$ t$_i$
/ *1NSG.POSS-mother-EP-OBL.SG-DAT who-EP-OBL.SG-ERG

na-n-mit-ə-tv-an-mək *pro$_{1du}$*
INV-CAUS-skilled-EP-INCH.VBLZ-VBLZ-1NSG.S/O 1DU.ABS

waŋav-at-ə-k t͡ɕawt͡ɕəva-t͡ɕ?enaŋ] [$_{RC_2}$ mek-ə-na-ŋ$_j$
word-VBLZ-EP-INF Koryak-ADV who-EP-OBL.SG-DAT

moto͡ɕɣ-ə-nan mət-ku-jeɲ-ŋ-ə-ne-w ovoɕa-w t_j
1NSG-EP-ERG 1NSG.S/A-PRS-bring-PRS-EP-3.O-3PL vegetable-ABS.PL

ɣamɣato͡ɕʔəʌo]] mət-ko-waɲav-at-ə-ŋ-∅
every.day 1NSG.S/A-PRS-word-VBLZ-EP-PRS-1NSG.S/O

'We are talking about our mother, who taught us to speak Koryak, to whom we bring vegetables every day.'

(351) a. [$_{DP}$ [$_{CP}$ ajɣəve ŋavəto͡ɕŋ-a mik-ə-ne-k$_i$ t_i
yesterday woman-ERG who-EP-OBL.SG-ERG

∅-en-aŋja-j *pro$_{1sg}$*] [$_{CP}$ mik-ə-ne-k$_j$
2/3.S/A.IND-1SG.O-praise-AOR 1SG.ABS who-EP-OBL.SG-ERG

t_j ɣəto͡ɕto͡ɕi mitiw t_j na-ja-kəʔajŋa-ɣe]] wutku
2SG.ABS tomorrow INV-FUT-scold-UW.PST here

∅-ku-jun-et-ə-ŋ-∅
2/3.S/A.IND-PRS-live-VBLZ-EP-PRS-3.S.IND
'The woman who praised me yesterday who will scold you tomorrow lives here.'

b. *[$_{DP}$ mitiw$_i$ [$_{CP}$ ŋavəto͡ɕŋ-a mik-ə-ne-k$_j$ t_j
tomorrow woman-ERG who-EP-OBL.SG-ERG

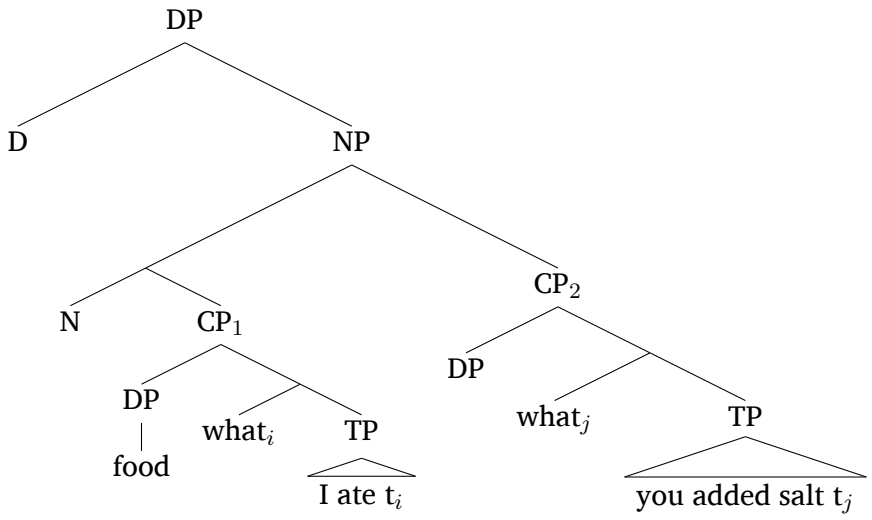
ajɣəve ∅-en-aŋja-j *pro$_{1sg}$*] [
yesterday 2/3.S/A.IND-1SG.O-praise-AOR 1SG.ABS

mik-ə-ne-k$_k$ t_k ɣəto͡ɕto͡ɕi t_i na-ja-kəʔajŋa-ɣe]]
who-EP-OBL.SG-ERG 2SG.ABS INV-FUT-scold-UW.PST

wutku ∅-ku-jun-et-ə-ŋ-∅
here 2/3.S/A.IND-PRS-live-VBLZ-EP-PRS-3.S.IND
intended: 'The woman who praised me yesterday who will scold you tomorrow lives here.'

Both of these facts fall out straightforwardly if inverse case attraction is due to the RC-head being inside the relative clause. In the case of stacked relatives, this means that the head is pronounced inside of the first relative clause and is not pronounced in the second one, as schematized in (352) for the sentence in (350a). Since there is no syntactic relationship between the pronounced head and the second relative clause, it stands to reason that the second relative clause's case should not be able to appear on the head. Likewise, assuming the displacement of the temporal adverb is clause-bound, it should not be able to precede material from the first relative clause unless it comes from that clause.

(352)



5.6 Left-Headed Internally-Headed Relative Clauses in Gur

The structure I have proposed for Koryak relative clauses with ICA involves internally-headed relative clauses where the head moves into the left periphery. This, as I have mentioned, is the structure proposed by Bianchi (1999) a.o. for EHRCs. However, I have shown that this cannot be correct, as relative clause heads in the left periphery of the relative clause are not marked with external case in Koryak. Apart from the arguments for Koryak inverse case attraction I have discussed, I have presented no evidence that the RC-internal left periphery is a valid landing site for the head of a relative clause. We might therefore be skeptical of complicating the analytical landscape for what may not appear to be significant extra data coverage. Fortunately for this proposal, relative clauses whose heads move into their left-periphery are widely attested in the Gur languages of West Africa. Most of the languages of this family have two types of relative clauses: one where the head of the relative clause (*mángò*) appears in-situ (353a), and another where it appears to the left of all of the RC-internal material (353b) (both of these examples come from Bùlì, a Gur language spoken in Northern Ghana). As argued in a series of works beginning with Hiraiwa (2005) (also including Hiraiwa 2009a,b; Bodomo and Hiraiwa 2010; Hiraiwa et al. 2017; a.o), the head of the relative clause in (353b) is in fact pronounced in a left-peripheral (pre-complementizer) position. In this section, I will present the arguments in favor of this analysis for Gur relative clauses, and show that this is in fact exactly the type of relative clause I argue to be instantiated by relative clauses with ICA.

(353) Bùlì (< Gur < Niger-Congo)

a. Àtìm dɛ̀ Àmɔ̀ak àlī dà mángò-tī: lá
Atim ate Amoak C bought mango-REL DEM
'Atim ate the mango that Amoak bought yesterday.' Hiraiwa (2005, p. 219)

b. Àtìm dɛ̀ mángò-tī: àtì Àmɔ̀ak dà lá
Atim ate mango-REL C Amoak bought DEM
'Atim ate the mango that Amoak bought yesterday.' Hiraiwa (2005, p. 219)

Recall from above that an RC-internal adjunct can appear before the head of an NPRC with inverse case attraction in Koryak, as illustrated in (354), repeated from (341a) above. In Bùlì, when the head of the relative clause precedes the rest of the RC, adverbial material like like *dīem* 'yesterday' can precede the head, as in (355). Koryak relative clauses with ICA and Bùlì left-headed relative clauses therefore pattern identically with respect to their ability to scramble RC-material across their head. Though not all Gur languages behave like Bùlì (and Koryak) in this respect, Hiraiwa (2009a) additionally reports that Kabiyé also allows RC-internal adverbs to precede the RC head.[35] The fact that RC-internal adjuncts can precede the head even when it is to the left of the complementizer shows that the head is located inside the relative clause.

(354) [$_{DP}$ ajɣəve {*ŋavət͡ɕŋ-ə-n / ✓ŋavət͡ɕŋ-a}
yesterday {*woman-EP-ABS.SG / woman-ERG}

mik-ə-ne-k$_i$ t$_i$ ∅- ena-kətʔajŋa-j *pro$_{1sg}$*]
who-EP-OBL.SG-ERG 2/3.S/A.IND-1SG.O-scold-AOR 1SG.ABS

pro$_{1sg}$ t-ə-je- ləʔu-ŋ-ə-n mitiw
1SG.ERG 1SG.S/A-EP-FUT-see-FUT-EP-3(SG).O tomorrow
'Tomorrow I will see the woman that scolded me yesterday.'

(355) Àtìm dɛ̀ [$_{RC}$ (dīem) mángò-tī: àtì Àmɔ̀ak dà lá]
Atim ate yesterday mango-REL C Amoak bought DEM
'Atim ate the mango tha Amoak bought (yesterday).' Hiraiwa (2005, p 219)

Another piece of evidence that leads to the same conclusion is illustrated in (356) and comes from the interpretation of quantifiers modifying relative clause heads. The sentence in (356a) has an in-situ internally-headed relative clause, whose head, *mángò*, is modified by a quantifier. The translation of the sentence shows that the quantifier is interpreted inside the relative clause, rather than outside of it, which would instead have the translation 'Atim ate all/some/most of the mangoes that Amoak bought.' The same interpretation obtains if the head of the relative clause moves past the complementizer and strands the quantifier (356b). In order to get the RC-external reading of the quantifier, the quantifier must occur to the right of the demonstrative *lá*, which marks the right edge of the relative clause (356c). What is crucial for our purposes is the sentence in (356d), where the quantifier moves past the complementizer with the RC head. Were the head in pre-complementizer position external to the RC, we would expect the sentence in (356d)

[35]The native-speaker-linguist of Bùlì that I consulted did not agree with the judgment in (355), saying that *dīem* could only occur immediately preverbally for him. I assume that this represents a dialectal or ideolectal difference.

to have the same interpretation as the sentence in (356c), which it does not have; instead, its interpretation is the same as that in (356a) and (356b). From this, we deduce that the quantifier is RC-internal rather than RC-external, leading to the conclusion that the pre-complementizer position that the RC head can occur in is inside the relative clause.

(356) a. Àtìm dɛ̀ [Àmɔ̀ak àlī dà mángò-tī: {mé:ná / gèlà
Atim ate Amoak C bought mango-REL.PL {all / some
/ yègà} lá]
/ most} DEM
'Amoak bought all / some / most (of the) mangos and Atim ate them.' (Hiraiwa 2005, 220)

b. Àtìm dɛ̀ [mángò-tī: àtì Àmɔ̀ak dà {mé:ná / gèlà
Atim ate mango-REL.PL C Amoak bought {all / some
/ yègà} lá]
/ most} DEM
'Amoak bought all / some / most (of the) mangos and Atim ate them.' (ibid. 221)

c. Àtìm dɛ̀ [mángò-tī: àtì Àmɔ̀ak dà lá] {mé:ná /
Atim ate mango-REL.PL C Amoak bought DEM {all /
gèlà / yègà}
some / most}
'Atim ate all/most/some of the mangoes that Amoak bought.' (ibid.)

d. Àtìm dɛ̀ [mángò-tī: {mé:ná / gèlà / yègà} àtì Àmɔ̀ak
Atim ate mango-REL.PL {all / some / most} C Amoak
dà lá]
bought DEM
'Amoak bought all / some / most (of the) mangos and Atim ate them.' (ibid.)

A final argument that Bùlì relative clauses with ex-situ heads are internally-headed comes from the interaction between selection and pied-piping. Consider the Bùlì sentence in (357a), which features a relative clause with a precomplementizer head without pied-piping. If this precomplementizer position were RC-external, the head *gbòŋ* 'roof' would be an argument of the matrix predicate *zyùàɣì* 'be big'. This is plausible: the subject of such a predicate must be a noun phrase. However, as (357b) shows, the postposition *zúk* 'on' can be pied-piped with the head into the precomplementizer position. Were this position RC-external, the predicate 'be big' would have the PP 'on the roof' as its subject, which it cannot have (cf. **On the roof that I slept is big*). Consequently, the head must be RC-internal.

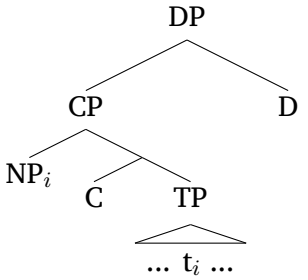
(357) a. [gbòŋ-kū:y àtì ǹ gwà *(kù) zúk lá] zyùàɣì
roof-REL C 1SG slept 3SG on DEM be.big

'The roof that I slept on is big.' Hiraiwa (2005, p. 222)

b. [gbòŋ-kūːy zúk àtì ǹ gwà lă] zyùàɣì
roof-REL on C 1SG slept DEM be.big
'The roof that I slept on is big.' (ibid.)

All of these facts motivate a structure whereby the head of the relative clause is on its left, but is nonetheless still inside it, as schematized in (358), which is identical to the one I have argued gives rise to inverse case attraction. This shows that the same syntax responsible for inverse case attraction in Koryak is also found in languages without morphological case marking. Put another way, left-headed internally-headed relative clauses are found not only in the Gur languages, but also in languages with morphological case like Koryak, where we call them relative clauses with ICA.

(358)



5.7 The Crosslinguistic Picture

5.7.1 Introduction

I have argued so far for an analysis of inverse case attraction that is specific to Koryak. However, this phenomenon is found in a variety of unrelated languages across the world (most famously, in ancient Indo-European languages,) and we might therefore wonder whether my account generalizes beyond Koryak. I will now argue that it does. This section surveys the properties of ICA in other languages where it is found, in particular, whether the head can be extraposed from the relative clause when it has internal case, whether RC-internal material can scramble across the head when it has internal case, and whether the entire relative construction has the distribution of a nominal. A negative answer to the first question and positive answers to the second and third constitute evidence in favor of my proposal. As we will see, for many languages (in particular, the ancient ones,) at least some of the relevant data does not exist, making it impossible to answer all of the relevant questions. Crucially, though, for most languages with ICA that have been documented, sufficient data exists to answer some of the questions, and no language that I have found has data that explicitly contradicts the analysis I propose for Koryak.[36] Based

[36]The observation that ICA forbids extraposition in a variety of languages was first made in Cinque (2015).

on this, I conclude that the analysis of ICA whereby the head bearing internal case is in a left-peripheral position inside of the relative clause can be extended to a wide variety of unrelated languages, and that it may provide a general solution to the problem of inverse case attraction in all languages.

5.7.2 Indo-European

As mentioned before, ICA was first noticed in ancient Indo-European languages. Given that these languages are no longer spoken, negative evidence in favor of my proposal does not exist. However, evidence from corpora suggests that ICA in Ancient Greek behaved identically to Koryak. For example, while the language allowed relative clause extraposition (Cooper and Krüger 1998, 544), the discussions of inverse case attraction in Kühner and Gerth (1904), Schwyzer and Debrunner (1950), and Probert (2015) contain no examples of phrasal material separating the head bearing internal case and the rest of the relative clause, though as Probert (2015, 164) notes, second-position clitics may intervene.[37] Indeed, Schwyzer and Debrunner (1950, 641) is rather explicit about this, writing that "when, of all the matrix clause, only the head noun precedes the relative clause, the head noun often assimilates in case to the relative pronoun...more rarely, when the whole matrix clause precedes the relative clause [the head noun often assimilates in case to the relative pronoun]."[38] Consequently, it appears that Ancient Greek, like Koryak, forbade the head of an RC with ICA (but not one without ICA) from being separated from the rest of the relative clause by phrasal material, but unlike Koryak, allowed the NPRC to either be clause-initial or clause-final. Additionally, a relative clause with ICA could be modified by an article Probert (2015, 164), showing that it was an NP/DP rather than a CP. I have not found any evidence of whether RC-internal material could scramble across a head with internal case. Consequently, Ancient Greek patterns like Koryak on two of the three tests for RC-head left-peripherality, and the data is so far indecisive on the third.[39]

Inverse case attraction is also found in some modern Indo-European languages, including Dari (Afghan Persian) and Xranje Albanian. According to Houston (1974), relative clauses both without (359a) and with (359b) inverse case attraction are permitted in Dari: in the former, the head of the relative clause is marked with nominative case, which is expected for the subject of the verb 'to be', whereas in the second, the head of the relative clause is marked with accusative since the pivot of the relative clause is an object. The

[37] I am grateful to Stanislao Zompì for looking through Kühner and Gerth (1904) and Schwyzer and Debrunner (1950) for me.

[38] Goodell's 1902 grammar of Attic Greek, a more pedagogical than linguistic work, says something similar though less explicit (§613): 'Rarely the antecedent is attracted to the case of the relative, the two standing side by side.'

[39] Despite the the fact that the existence of inverse case attraction in Latin is well-established, I have not found any philological works that systematically describe its properties.

contrast in (360) shows that Dari behaves like Koryak with regards to extraposition: the relative clause can be extraposed when the head has external case (360a), but not if it has internal case (360b). Consequently, the facts extraposition facts of Dari support the Koryak-like analysis of inverse case attraction.[40]

(359) a. dɔxtar ey ke jɔn mišnose inja æs
girl the.NOM PTCL John know.3SG here be.3SG
'The girl that John knows is here.' (Houston 1974, 43)

b. dɔxtar ey ra ke jɔn mišnose inja æs
girl the ACC PTCL John know.3SG here be.3SG
'The girl that John knows is here.' (ibid.)

(360) a. dɔxtar ey inja æs ke jɔn mišnose
girl the.NOM here be.3SG PTCL John know.3SG
'The girl that John knows is here.' (constructed based on the description)

b. *dɔxtar ey ra inja æs ke jɔn mišnose
girl the ACC here be.3SG PTCL John know.3SG
intended: 'The girl that John knows is here.' (Houston 1974, 43)

Data from Xranje Albanian shows the same thing. The two sentences in (361) show that ICA is permitted in the language, as the head of the relative clause, 'boy', can be marked with either external nominative case or internal accusative case. However, when the relative clause 'that I saw' is extraposed from the head, only the external nominative case is allowed.

(361) a. Djali që e pashë unë iku
the.boy.NOM that him saw I left
'The boy that I saw left.' (Bevington 1979, 273-274)

b. Djalen që e pashë unë iku
the.boy.ACC that him saw I left
'The boy that I saw left.' (ibid.)

(362) a. Djali iku që e pashë unë
the.boy.NOM left that him saw I
'The boy that I saw left.' (ibid.)

b. *Djalen iku që e pashë unë
the.boy.ACC left that him saw I
intended: 'The boy that I saw left.' (ibid.)

The final modern Indo-European language that I have found with inverse case attraction is (nonstandard) Icelandic, as described in Wood et al. (2017), which reports on the results

[40]Whether or not Dari behaves like Koryak with regards to scrambling is not mentioned in any sources on the language that I have found. Unfortunately, ICA is not allowed in the much better studied Iranian dialect of Persian, Farsi (Zahra Mir Razi, Neda Deylami p.c.).

of a large-scale survey of native Icelandic speakers. The data are quite complicated and the contrasts reported are gradient rather than categorical (no doubt in part because ICA is proscribed in formal Icelandic), but Wood et al.'s relevant finding is that extraposition of a relative clause from a head bearing ICA is judged to be markedly worse than non-extraposition, even though extraposition is usually allowed in the language.

In sum, a survey of the properties of ICA in both ancient and modern members of the Indo-European family finds only properties that are compatible with the analysis of ICA advanced here. Further, evidence from Ancient Greek supports the idea that the left-edge requirement on Koryak ICA is not an inherent part of the phenomenon itself, and should therefore be explained on a language-particular basis.

5.7.3 Uralic

The Uralic family is another place where inverse case attraction is widely attested. Consider first Ingrian Finnish (Kholodilova 2013), which shows similar behavior to Koryak in many respects. First, like in Koryak, the NPRC with ICA must be at the left edge of the sentence, which is not the case for an NPRC whose head has external case. This is demonstrated by the contrast in (363). When the NPRC, a subject, is sentence initial, the head can be marked with either the external nominative case, or the internal genitive case. However, when it occurs sentence-finally, only the external nominative case is permitted.

(363) a. {lammas / lampà-n} minkä miä eilen
{sheep.NOM / sheep-GEN} what.GEN 1SG.NOM yesterday

ost-i-n loikò koi-n luon
buy-PST-1SG lie.PRS.3SG home-GEN near
'The sheep I bought yesterday is lying in front of the house.' Kholodilova (2013, ex. 1,5)

b. talo-n luon loikò {lammas / *lampà-n}
house-GEN near lie.PRS.3SG {sheep.NOM / *sheep-GEN}

minkä miä eilen ost-i-n
what.GEN 1SG.NOM yesterday buy-PST-1SG
'In front of the house, there is a sheep I bought yesterday.' (ibid. ex. 6)

Additionally, both extraposition and scrambling in Ingrian Finnish behave as in Koryak: the sentence in (364) shows that the RC can only be extraposed from the head if it is marked with the external nominative case, and the sentence in (365) shows that RC-internal material can scramble across the relative clause's head only if it has internal genitive case.

(364) {lammas / *lampà-n} loikò koi-n luon minkä
{sheep.NOM / *sheep-GEN} lie.PRS.3SG home-GEN near what.GEN

miä eilen ost-i-n
1SG.NOM yesterday buy-PST-1SG
'The sheep I bought yesterday is lying in front of the house.' (Kholodilova 2013, ex. 9)

(365) miä {lampàn / *lammas} minkä ostin,
1SG.NOM {sheep.GEN / *sheep.NOM} what.GEN buy.PST.1SG

lojkò talon luon
lie.NPST.3SG house.GEN near
'The sheep I bought yesterday is lying near the house.' Kholodilova and Privizentseva (2015, ex. 21)

Finally, a variety of morphosyntactic tests show that relative clauses with inverse case attraction are nominal rather than clausal, showing that they cannot be correlatives. For example, the head of a relative clause with inverse case attraction can be modified by a quantifier, whereas the head of a correlative cannot be.

(366) kaik-i-l' ihmis-i-l' ke-l' miä kiruta-n kirjo-i-∅
all-PL-ALL man-PL-ALL who-ALL I.NOM write.PRS-1SG letter-PL-PART

ellǟ-t Suomè-s
live.PRS-3PL Finland-IN
'All the people to whom I write letters live in Finland.' (Kholodilova 2013, ex. 23a)

Kholodilova and Privizentseva (2015) also discusses Besermyan Udmurt which, despite being only distantly related to Ingrian Finnish, shows the same behavior as it regarding scrambling of RC-internal material and extraposition. ICA constructions in Besermyan Udmurt also have an additional property not discussed for Ingrian Finnish supporting their analysis as nominals rather than clauses: an NPRC with ICA can be coordinated with another noun phrase. An example of this is given in (367), where the head of the noun phrase 'the man to whom I gave potatoes' can be marked either with external nominative case or internal dative case when it is coordinated with the nominative-marked noun phrase 'my brother.' On the (uncontroversial) assumption that only elements of the same category can be conjoined, this shows that ICA in Besermyan Udmurt does not involve a correlative structure. Note also that while there is a left-edge restriction on ICA in this language, the sentence in (367), where the NPRC with ICA is coordinated with a noun with external case and follows it, shows that it's the constituent containing the NPRC with ICA that must be at the left edge of the sentence, not the NPRC itself.

(367) mân-a-m brat-e i {ad'ami / ad'ami-lâ}
1SG-GEN1-POSS.1 brother-POSS.1SG and {person / person-DAT}

kud-iz-lâ mon š'ot-i kartoška d'eš'-eš' drog'jos
which-POSS.3-DAT 1SG give-PRT potato good-PL friend.PL
'My brother and the man to whom I gave potatoes are good friends.' Kholodilova and Privizentseva (2015, ex. 30)

Other Uralic language with the same extraposition and scrambling facts as Ingrian Finnish and Besermyan Udmurt include Moksha (Privizenceva 2016) and Hill Mari (Dëmina 2019). The latter of these provides another example of the crosslinguistic diversity of word-order requirements on the NPRC with ICA, which merely needs to be preverbal, not clause initial. An example of this is provided in (368), where the NPRC 'mountain that their house is on', whose head is marked with internal inessive case, follows the subject pronoun *mən'* 'I.'

(368) mən' kârâk-âštâ kâ-štâ nən'-ən pört šənž-ä
1.SG.NOM mountain-IN which-IN 3PL-GEN house.NOM sit-NPST.3SG

už-em
see-NPST.1SG
'I see the mountain that their house is on.' Dëmina (2019, ex. 5a)

A survey of four Uralic languages with ICA finds that all of them behave like Koryak with respect to extraposition and scrambling, and that there is some diversity among them with respect to where in the sentence the NPRC with ICA can occur. All of these are predicted by my account. One thing that is not obviously predicted by my account, however, is the fact that some Uralic languages allow case mismatches between the head and the relative pronoun in ICA.[41] Such a situation arises when the pivot of a relative clause is in a syntactic position where there is more than one case that it can be assigned, as shown in (369). This example shows that the postposition *maṛtə* 'with' can take either a nominative or a genitive complement. When that complement is the pivot of a relative clause, the head can be marked genitive even though the relative pronoun is nominative.[42] This does not follow from anything in my account, which holds that the head and the relative pronoun initially form a constituent, are assigned case in their base position, and are only subsequently separated once they have moved into the relative clause's left periphery.

(369) a. mon l'ad'-ən' fkɛ {s'ora-n'ɛ / s'ora-n'ɛ-n'} maṛtə
I befriend-PST.1SG one {boy-DIM / boy-DIM-GEN} with
'I made friends with one boy.' Privizenceva (2016, 22)

[41]Thanks to Maria Kholodilova for bringing this fact to my attention, and to Mariia Privizentseva for discussing it with me.

[42]This behavior is not restricted to the complements of adpositions: Kholodilova (2013, ex. 18a) shows an example of this with a direct object, which can be marked with either partitive or genitive case in Ingrian Finnish.

b. s'ora-n'ɛ-n', kona maɻ̥tə l'ad'-ən' ingəl'-t'i,
boy-DIM-GEN which with befriend-PST.1SG before-DEF.SG.DAT

tu-s'
leave-PST.3SG
'The boy that I had earlier made friends with left.' Privizenceva (2016, 23)

My suspicion is that the correct analysis of this case mismatch reduces to what exactly it means for *maɻ̥tə* to be able to assign more than one case. One way to understand this is to say that what *maɻ̥tə* assigns is not *either* nominative *or* genitive, but is instead an underspecified structure that can be realized as either of those cases. This is in line with approaches to case-marking in both DM and Nanosyntax that, on the basis of patterns of syncretism in case paradigms, take case categories to not be morphosyntactic primitives, but rather to be the result of combinations of case features in a containment relationship with each other (Caha 2009; Zompì 2017; Smith et al. 2019, a.o.) On this view, then, what the head + RP complex is assigned in the complement of the adposition underdetermines what case it can be spelled out as, which is only determined after excorporation of the head from the head + RP phrase. As a result of this, the two elements can realize their case features independently of each other, leading to a mismatch. Assuming that verbs can assign underspecified case features therefore provides a way out of the problem of case mismatches for the theory of ICA advanced here.[43]

5.7.4 Nez Perce

Inverse case attraction is perhaps best known in the syntactic literature from Nez Perce, a critically endangered Sahaptian language of the northwestern United States. As described and analyzed in Deal (2016), Nez Perce has one of the stricter left-edge conditions on inverse case attraction, as the NPRC with ICA not only needs to occur sentence initially, but must also be separated from the rest of the sentence by a 'clear prosodic break' (Deal 2016, 457). This fact, among others, motivates Deal's conclusion that inverse case attraction in Nez Perce requires the entire noun phrase to be a topic left-dislocate, as indicated by the translation of the sentence in (370). This is a notable difference from Koryak: as discussed above, the NPRC does not have to be a topic in Koryak (it can, for example, serve as the answer to a *wh*-question (333)), and, even for speakers who allow left-dislocated NPs, NPRCs with ICA don't show the same obligatory resumption found in NP left-dislocation.

[43]Note that, as long as the process of attraction posited in certain EHRC analyses of ICA takes place before the case affix is inserted, this solution would also be applicable to the EHRC analysis. That is, the attraction would have to be of (underspecified) case features, not of anything derivationally later than them.

(370) Ko-nya samaχ̂-na ko-nya$_i$ kex *pro* ‘a-sayq-caqa t$_i$ mine
that-ACC shirt-ACC RP-ACC C PRO.1SG AGR-like-TAM where

pro hii-we-s?
PRO.3SG AGR-be-TAM
‘That shirt that I like, where is it?’ (Deal 2016, 96a)

It is not known whether scrambling of RC-internal material across the head is allowed in Nez Perce, nor is it known whether extraposition of a relative clause is banned when the head is marked with internal case.[44] Consequently, the known facts of Nez Perce neither confirm nor disconfirm the analysis of ICA as involving IHRCs with heads in the left periphery of the relative clause. However, they do provide further evidence that the left-edge restriction is not identical across languages, which helps validate the fact that this analysis does not take the requirement that Koryak relative clauses occur at or near the left edge of the sentence to be a crucial component of ICA.

5.7.5 Chukotkan

Given that Koryak has inverse case attraction, we might wonder whether any of the other Chukotkan languages (Chukchi, Alutor, and Kerek) has it. Unfortunately, it’s not clear. The syntax of Chukotkan languages has received very little attention, and to my knowledge there has only been one published paper devoted to relativization in a Chukotkan language, Polinsky (1994) on Chukchi. This article does not describe anything that looks like inverse case attraction. The two grammars of Alutor, Nagayama (2003); Kibrik et al. (2004), do not mention inverse case attraction, and Kerek became extinct before extensive work on it could be undertaken. However, Kozlov (2020) contains a description of a type of relative clause in the Amguema dialect of Chukchi that might considered a participial relative clause with inverse case attraction, though it could equally well be thought of as an internally-headed participial relative clause. An example of this is given in (371), where the subject of the intransitive verb ‘fall’ is the NPRC ‘the person who digs a hole.’ The head of the NPRC is marked with instrumental case (which is what Kozlov calls the case that I call ‘ergative’ in Koryak), as befits the subject of a transitive verb (the RC-internal ‘dig.’) Since this relative structure does not (obviously) contain a full clause, and the fact that enough is not known about Chukchi syntax for us to be able to identify the position that the head is in, it is not obvious whether to take (371) to represent an internally-headed relative clause with an in-situ head or a left-peripheral one. Consequently, Chukchi has a structure that is a candidate for identification as inverse case attraction, but more work on the language would be necessary to take a definite position on it either way.

[44] In fact, as Amy Rose Deal (p.c.) has pointed out to me, independent facts about Nez Perce make it difficult to say whether the language allows RC extraposition at all.

(371) [$_{RC}$ orawetɬa-ta rəɣətko-jo təroosɣ-ən] sinit ən-kə
person-INST dig-PTCP.TR hole-NOM.SG self there-DAT

ra-peqetat-ɣʔa
FUT-fall-TH-2/3SG.S

'The person who digs a hole will fall into it himself.' Kozlov (2020, ex. 45)[45]

5.8 Conclusion

In this chapter, I've argued for a syntax for relative clauses with inverse case attraction in Koryak whereby their heads are pronounced in a left-peripheral position inside the relative clause. This permits a unification of ICA constructions and the left-headed internally-headed relative of Gur languages, which have no overt case marking. This is a welcome unification as it obviates the need to posit any special mechanisms to account for ICA. Additionally, based on a survey of inverse case attraction in the languages where it has been subject to detailed study, it seems possible that this chapter's proposal provides a general solution to ICA crosslinguistically. Looking beyond ICA specifically, I have argued that relative clauses whose heads do not have RC-internal case cannot be pronounced in an RC-internal position, as has been advanced by proposals couched in the antisymmetry framework. A reexamination of how to account for the facts of externally-headed relative clauses in this framework is therefore in order.

As its title suggests, the goal of this chapter has been to deconstruct inverse case attraction into its more basic morphosyntactic components, thereby moving away from constructional analyses that have previously been given for the phenomenon. One obvious loose end stands in the way of such a deconstruction: the left-edge requirement. Further work on the mapping between syntax and information structure in languages with inverse case attraction (including in Koryak) will shed light on the syntactic and discourse properties of NPRCs with ICA that cause them to appear at or near the left edge of the sentence. In addition to clarifying the analysis of ICA in particular languages, such work would provide greater clarity regarding the extent to which the left-edge requirement can be given a unified crosslinguistic analysis. Future research will hopefully tie up this loose end.

[45]The translation into English is by me, though I have left the glosses and morpheme breakdown as they are in the original work.

Chapter 6

Conclusion

This dissertation has made three independent points, all based primarily on data from Koryak.

The first is that phonological operations need to be able to apply to independent morphemes. This was supported by two case studies in Koryak phonology, one concerning the distribution of *w* and *v* in morpheme-final position, and the other concerning the language's vowel harmony system. In the first case study, showed that while the segments *w* and *v* are generally in a contextual neutralization relationship with one another, in morpheme-final position, and only in this position, they do not contrast, and instead *v* appears prevocalically and *w* appears elsewhere, a distribution that is otherwise attributed to underlying /v/. Based on this, I have argued that /w/ must be excluded from final position in the underlying representations of Koryak, and have shown that attempts of other proposals in the literature to account for such a distribution (usually by positing a derived environment effect) do not work. In the following chapter, I argue that Koryak vowel harmony is the result of a restricted set of floating features associated with morphemes spreading across the word to obligatorily-underspecified vowels. Both the combinations of licit floating features and the obligatory underspecification of the vowels needs to be derived by phonology operating at the morpheme level. These proposals are incompatible with most models of phonology proposed since the 1970s, which have attempted to derive the effects of morpheme-level phonology without making direct reference to morphemes. In proposing this, I have assumed that the input to the phonological grammar does not have language-specific properties, following the Richness of the Base Prince and Smolensky (1993), but given the conclusions I have come to about morpheme-level phonology, I have taken it to apply at a different level than in Standard OT. Instead of the input to the grammar being the morphemes themselves, I have taken the input to be a level whose output is the set of possible morphemes of Koryak, and have argued that, at least for the phenomena under discussion here, only that level and the surface level are necessary to deriving the attested patterns. In short, the Koryak patterns are derivable in a version of

Standard OT that gives up monostratal evaluation.

The second point is that dependent case-marking can be triggered at the intermediate steps of *wh*-movement. I first argued that ergative case and certain instances of dative case in Koryak are dependent cases (Marantz 1991; Baker 2015) based on a variety of static restrictions on case frames, argument-structural alternations, and patterns of agreement. I then showed that *wh*-movement of an absolutive noun phrase out of a finite clause triggers obligatory ergative marking on the subject of a verb that can be absolutive in the absence of *wh*-movement, and that *wh*-movement of an absolutive noun phrase across the absolutive argument of an object control verb triggers dative case on it. I proposed an analysis of this whereby the change in case-marking under movement is due to the presence of intermediate copies of movement within dependent case domains, which can trigger dependent case on the other nominal in the case domain. Further support for this analysis came from the fact that moving non-absolutive noun phrases do not trigger these changes in case-marking. This analysis shows that the inherent analysis of ergative case, where the presence of ergative case is related to a DP's theta-role, is not applicable to all ergative languages.

The third point that was argued for in this dissertation is that inverse case attraction does not actually involve a morphosyntactic process of attraction. Instead, it is the predicted result of internally-headed relative clauses whose heads are in the left periphery in languages with overt case marking. To show this, I argued that relative clauses with inverse case attraction have neither the syntactic nor semantic properties associated with correlatives crosslinguistically, nor do they have the syntactic properties of externally-headed relative clauses. Instead, I showed that while they behave for the purpose of external syntax largely like externally-headed relatives, their head is internal to the relative clause. This derives the fact that their head is marked with relative-clause internal case, and correctly predicts that their head should be able to be preceded by relative-clause-internal material. This unifies inverse case attraction with a kind of relative clause argued to exist in the (caseless) Gur languages of West Africa: left-headed internally-headed relative clauses (Hiraiwa 2005 et seq.) As a result of this, inverse case attraction does not require us to posit an independent morphosyntactic process of case attraction.

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