Universität Leipzig

Institut für Linguistik

BA Thesis

Inverse Marking in Plains Cree

Author:
Yuriy Kushnir
3230366

Supervisors:
Prof. Dr. Gereon Müller
Dr. Jochen Trommer

June 11, 2015

Contents

List of Used Abbreviations

1	1st person exclusive
12	1st person inclusive
2	2nd person
3	3rd person
3'	3rd person obviative
0	3rd person inanimate
ABS	Absolutive
ACC	Accusative
AG	Agent
AN / ANIM	Animate
APPL	Applicative
BEN	Benefactive
CONJ	Conjunctive
DEF	Definite
DEP	Dependent
DIR	Direct
DP	Determiner phrase
ERG	Ergative
F / FEM	Feminine
INDEF	Indefinite
INDEP	Independent
INV	Inverse
INAN	Inanimate
M / MASC	Masculine
OBJ	Object
OBL	Oblique
OT	Optimality Theory
OBL	Oblique
OBV	Obviative
PART	Participant
PAT	Patient
PL	Plural
PN	Proper name
PROX	proximate
PRS	Present tense
PST	Past tense
SAP	Speech act participant
SBJ / SUBJ	Subject
SG	Singular
TAM	Tense, Aspect, Mood
TOP	Topic
U	Undergoer

1 Introduction

The main goal of this thesis is investigating the phenomenon of *inverse morphology* in the Algonquian language Plains Cree spoken in parts of Southern Canada. One of the distinctive features of Cree (as well as many other indigenous languages of the Americas) is its complex verbal morphology, part of which compensates for a poorly developed system of flagging on nominal phrases. Apart from a rather unspecific locative marker and a vocative form with a restricted usage domain (Dahlstrom 1991), nominal phrases in Cree do not receive any case markers to indicate their syntactic roles in predications with multiple participants. In order to provide a proper account for the argument distribution, multiple inflectional markers are used on the predicate to reflect the exact *configuration of its arguments*.[1]

Linking (i.e. providing information about the manner in which a predicate relates to its arguments), is undoubtedly one of the most central parts of Grammar in all natural languages (see Stiebels 2002). When predicates are saturated with arguments, the saturation happens in a particular order in multi-valent predications, this order reflecting which ϑ-roles are assigned to the various participants. For example, a simple two-place predicate like *love* will have the following shape in Lambda-Calculus: λyλx[LOVE(x,y)]. The order of the arguments in the round brackets under LOVE is crucial. In this case, it implicitly assumes that the argument on the left is the Agent and the one on the right is the Patient. Even more crucially, the left side of the notation dictates the order in which the predicate is to be saturated. The first argument it is supposed to take is the Patient/Theme (the internal argument), followed by the Agent (the external argument). Instead of separating the two variables with a comma, we could re-write the argument raster of the verb in the following manner: LOVE [x, [y]]. The bracket structure then reflects the hierarchical ordering of the two participants. The saturation of the predicate happens in an upward manner from the innermost to the outermost argument position.

Every natural language has a way of reflecting this hierarchy on the surface. Genetically different languages display typologically different approaches to solving this central problem. One trivial method is introducing a *fixed order of words*. It is, in fact, a clean and elegant solution because it imposes a constraint on the syntactic structure prohibiting the so-called *scrambling* of elements within a syntactic tree. This means that, after being merged with the head verbs, the arguments are required to remain exactly in their merging positions before and after linearization. Alternatively, they can be moved up in the hierarchy, the movement being triggered by functional heads dominating the verbal projection (e.g. T/Infl, Agr, C). However, the basic structure is not subject to random permutations caused by pragmatic or, even worse, some arbitrary factors. The relative positioning of the head verb and its core arguments is, of course, subject to typological variation. However, within one language, this layout usually remains stable. As an example, one could consider a simple SOV grammar where a finite clause is always head-final, preceded by its core arguments. Crucially, the internal argument is the first to be concatenated and must stay below the external argument in the hierarchy, which also has to be reflected in the surface structure. In this case, it is not mandatory for either the head verb or the argument to bear any additional grammatical elements indicating their

[1] These markers regularly appear on the surface together with independently used nominal phrases and/or personal pronouns, which can serve as an indicator of their status as true inflectional affixes and not merely phonologically bound pronouns.

grammatical roles. Indeed, in a language with limited morphology, one could literally have a proposition containing three root elements: S – O – V. The relative order of the two arguments indicates that the first one is the Agent and the second one the Patient.

In English (an SVO language with a fairly rigid order of words), one readily comes up with plenty of examples where only the order of the constituents reveals their relationship with the head predicate:

(1.1) Ann loved Tom
Tom loved Ann

Many languages (including some with a relatively rigid word order) have, however, a more elaborate way of disambiguating argument configurations in transitive and di-transitive predications. The two possible approaches are:

- employing grammatical flags on the DP's serving as the core arguments of a predicate verb. This is called ***dependent marking*** since the grammatical role markers are placed on the elements indexed by the clausal head;
- employing grammatical markers on the head verb itself indicating various features of the arguments that it has indexed. This strategy is called ***head marking***.

Even though modern English has relatively poor inflectional morphology and has to rely on word order (see above), it actually exhibits both patterns I have just mentioned (in a very limited way). For instance, in the sentence *John sees me*, the personal pronoun *I* has the form *me* reflecting its status as the internal argument of the predication. **John sees I* is grammatically incorrect. This (drastic) change in the form of the personal pronoun is one possible *dependent-marking* strategy. Moreover, the verb *see* takes the grammatical formative /-z/ indicating that the verb is in the present tense AND that the subject of the sentence (i.e. the external argument in this case) is a 3rd-person singular argument (3SG.NOM). This is a fully legitimate head-marking element.

The problem of Modern English is that, apart from several relic forms of personal pronouns and the one specific formative /-z/ (for most verbs), there are no more morphological linking tools. It is indeed the order of words alone that determines the status of the arguments in the sentence *Maria saw the children.* Both *Maria* and *the children* are non-pronominal nominal phrases, for which English has no *I <> me / he <> him ...* alternations. Also, the verb *saw* appears in the past tense, which means it does not take the formative /-z/ in the singular (past-tense verbs, except for *be*, do not agree with their subjects). For both *Maria* and *the children* being the spectator, the form is invariably *saw.* Indeed, swapping out the two arguments yields a completely different sentence: *the children saw Maria.* This is exactly the same situation as the one in (1.1).

In many languages, the tools used to mark the syntactic roles of a predication's core arguments are significantly more elaborate than those found in English. For instance, in Lithuanian, all noun phrases, not only personal pronouns, have distinct subject and object forms, which means that, depending on who sees whom, *Maria* and *the children* will change their form respectively. The order of words actually doesn't matter much in Lithuanian (except, perhaps, those Low Lithuanian dialects where nominal phrases have reduced morphological inventories with significant degrees of syncretism).

(1.2) Lithuanian (own data)

a.	Marij-a	mat-ė	vaik-us
	PN-NOM.SG	see-3.PST	child-ACC.PL
	'Maria saw the children.'		
b.	Vaik-ai	mat-ė	Marij-ą
	child-NOM.PL	see-3.PST	PN-ACC.SG
	'The children saw Maria.'		

Language that do use regular morphological tools for Linking can be combined into the following groups:

- purely dependent-marking languages, i.e. such language that only use flags (= case formatives) on nominal phrases, but the clausal verb does not reflect any of the features of its core arguments (does not undergo agreement with them). A poster-child example of such a language is Japanese:

(1.3) Japanese (adopted from Seiichi 1994:3)

boku=wa	hon=o	kai-ta
1=TOP	book-ACC	write-PST
'Me, I wrote a book.'		

- purely head-marking languages, i.e. such languages where nominal phrases do not reflect their syntactic roles morphologically, but the clausal verb undergoes agreement with one or more arguments reflecting various features thereof, including their syntactic roles (not in all languages). A lot of Native-American languages are purely head-marking, e.g. Plains Cree, Mapuche or Hoocąk:

(1.4) Hoocąk (data provided kindly by Iren Hartmann, MPI EVA, Leipzig)

hocįc-įk=ra	ważątire=ra	wa-hį-gi-ruža-ire
boy-DIM=DEF	car=DEF	OBJ.3PL-1.U-APPL.BEN-wash-SBJ.3PL
'The boys washed my cars.'		

- mixed languages, where both strategies are employed. These include English and many further languages, such as Russian, Geogrian, Arabic, Greek etc. Many languages that have overt cases on nouns restrict verbal agreement to one argument only, while others (such as Georgian) use noun cases and a full agreement paradigm on head verbs.

(1.5) Russian (own data)

a.	ja	jem	ryb-u
	1SG.NOM	eat\SBJ.1SG.PRS	fish-ACC.SG
	'I am eating fish.'		
b.	ryb-a	jest	menia
	fish-NOM.SG	eat\SBJ.3SG.PRS	1SG.ACC
	'The fish is eating me.'		

In a purely head-marking language like Cree, a bivalent verb will normally agree with both of its arguments, canonically the *Agent* and the *Patient*. In terms of flagging the φ-features and the ϑ-roles of the respective arguments, the following scenarios are possible:

1. A portmanteau morpheme indicating the φ-features of both arguments, as well as their ϑ-roles, e.g. [*MARKER*] { φ1ϑ1, φ2ϑ2 };
2. A portmanteau morpheme reflecting only the φ-features of both arguments, e.g. [*MARKER*] { φ1, φ2 }. In this case, an additional mechanism needs to be used in

order to determine which argument is the actor and which one is the undergoer in a given configuration. More on this will be said underneath;

3. Two independent morphemes encoding the φ- and ϑ-features of the arguments, e.g. [*MARKER1*] {φ1ϑ1}, [*MARKER2*] {φ2ϑ2};
4. Two independent morphemes encoding only the φ-features of the arguments, e.g. [*MARKER1*] {φ1}, [*MARKER2*] {φ2}. In this case, a mechanism similar to that mentioned in (2) must be applied, as well.

In some languages, such as Kichean (Preminger 2014), the verb will agree with the more salient (= more central from the point of view of the current discourse parameters) argument. In this case, its ϑ-role may or may not be indicated. In the latter case, one will again deal with a configuration where a disambiguating mechanism is needed.

A possible disambiguating mechanism (for configurations in (2) and (4)) can be implemented in multiple different ways including the very common means of fixing different arguments in distinct surface positions (= word order). In this case, marking the φ-features of one or both arguments would be, in a way, a redundant process since it would not contribute anything to the parsing of the predication by the listener. The only language behaving in this manner that I am personally aware of is Kichean (Preminger 2014, Chapters 4 & 5), where there is a special agent-focus construction in which the verb obligatorily agrees with the more salient argument, but Linking essentially relies on word order.

Another method, which is statistically much less frequent, is the so-called INVERSE MARKING. Inverse marking is based on salience hierarchies where the participants of a (di)transitive predication are ranked intrinsically in the mind of the speaker according to their salience / centrality for the current discourse. In most cases, the speaker's language imposes certain ranking principles which cannot be overridden by pragmatic considerations. Thus, arguments referring to speech act participants (= SAP) are virtually always considered to be more salient than third-person arguments: SAP » 3 (this is also the fact in other languages demonstrating the salience effect, regardless of whether they have inverse marking or not).

While there are systems with fairly simple ranking systems (e.g. the one presented at the end of the previous sentence), some languages demonstrate quite elaborate and fine-grained salience hierarchies where third-person arguments are subdivided into multiple subtypes increasing the chances that the two participants of a random transitive predication will be placed on two distinct hierarchy levels. The system observed in Cree is fairly complex:

(1.6) 2 » 1 » 3ANIM.PROX » 3ANIM.OBV » 3ANIM.FOBV [2] » 3INAN

The abrreviations used in this hierarchy will be made clear in the sections to come.

The basic idea behind the concept of inverse morphology is that subjects are expected to be more salient than objects. If this is not the case, special inverse markers are employed to 'alarm' the listener and signal to them overtly that the current argument configuration is unexpected. This phenomenon is typologically quite rare and observed in relatively few languages, Plains Cree being one of them. The goal of this thesis is to carry out an "under-the-hood" analysis of the agreement pattern observed in Plains Cree

[2]further obviative (this concept will be explained below)

and investigate the nature of the INVERSE PATTERN.

The **main claim** that I pursue in this study is that, in Plains Cree, there is no morpho-syntactic feature of the type (±)INV. Instead, its *direction markers* (see below) can be easily re-analyzed as fairly straightforward case affixes whose occurrence is determined by the salience hierarchy described above. This would pattern Plains Cree with many other languages which demonstrate the so-called *Diferential Case Marking* phenomenon (see Aissen 2003).

In the sections below, I will briefly introduce the language, then describe the phenomenon in focus in more detail, introduce the theoretical framework which I will be using for my analysis, and, finally, introduce the notion of differential case marking and apply it to the system of verbal agreement affixes found in Plains Cree. I will also show how the same effects can be implemented in OT using a special kind of constraint used to eliminate a marked configuration of features.

2 Plains Cree and Inverse Morpholgy

2.1 Plains Cree: Portfolio

Taxonomy: Algonquian → Cree (120,000) → Plains Cree.

The language has a fairly simple phonemic inventory: 10/11 consonants; 6/7 vowels (3 short and 3/4 long). Notorious is the merger of the Proto-Algonquian rhotic /r/ with other sonorants (the exact phoneme varies by dialect; /j/ in Plains Cree). Since there are also no lateral consonants, the language lacks liquids entirely.

There is basically no dominant word order (Dahlstrom 1991). Why the geographically proximate Sioux languages are relatively strictly SOV (WALS), Cree displays all types of predicate/argument placement within affirmative statements.

Morphologically, the language is polysynthetic (due to its complex verbal morphology outlined below; an example can be seen in (2.1)), with a certain degree of fusion (morpheme boundaries may be obscure due to morpho-phonological processes). There are no inflectional classes, so Cree is not inherently flexive apart from the already mentioned fusional features. The dominant inflectional mechanism is suffixing (with the exception of a few agreement prefixes and some preverbs).

(2.1) Plains Cree (Dahlstrom 1991:10)
ni-waapam-aa-w-ak
1-see-1/2.ABS-3.ANIM-3PL
'I see them.'

The system of nominal flagging is very primitive. Besides a semantically quite obscure locative affix, there are virtually no case markings. However, nominal phrases are regularly marked for plurality and obviation (see below).

Cree has a highly complex system of verbal morphology. Transitive verbs agree with both arguments and can take multiple TAM markers. Since there are no structural cases on DP's, Cree is a strictly head-marking language.

Central to the grammatical system of the language is the following gender distinction: *animate / inanimate*. Nouns have inherent gender. The gender of a verb's argument

influences not only the morphology of the argument itself, but also the lexical choice of the appropriate verb stem. Thus, semantically identical or nearly identical verbs display different stems (typically by using derivational morphology) depending on the animacy status of their core arguments. Intransitive verbs vary according to the animacy status of their only argument; transitive verbs select animate/inanimate internal arguments. For instance, the verb stem 'waapaht' translates as 'to see something', while 'waapam' stands for 'to see someone'.

Inverse morphology – the central topic of this paper – is restricted only to transitive verbs with animate objects, or VAT. This will thus be the primary verb group relevant for this study.

The concept of *obviation* is extensively used in the Algonquian languages and is one of the characteristic typological features of the family. Obviation comes in handy when one deals with configurations where there are two or more 3rd-person participants. In this case, one is usually picked out as the most salient/central one for the current discourse and is therefore deemed *proximate*. All other third-person actants are then considered to be *obviative*, i.e. less central / less prominent in the foreground. There are propositions without a single proximate argument, but if there are any, there may only be one per predication. All non-proximate DP's have to be overtly marked as obviative using bound nominal morphology. The obviative affix replaces plural morphology, so an obviatvie DP is underspecified for number. Obviative arguments are also marked distinctly on verbs. Crucially, the use of obviation allows two animate 3rd-person arguments to be ranked on two different hierarchical levels (this is in its turn central for the case-encoding mechanism which is discussed extensively below).

Table 2.1. Nominal morphology in Plains Cree (from Dahlstrom 1991)

	Animate	Inanimate
Prox.Sg	naapeew 'man'	miinis 'berry'
Prox.Pl.	naapeew-ak	miinis-a
Obv.Sg.	naapeew-a	miinis
Obv.Pl.	naapeew-a	miinis-a

Intrinsic to the grammar of Plains Cree is the so-called *ontological salience hierarchy* (Klaiman 1992), already shown in (1.6). That means, every DP denoting a referent is assigned a certain ranking depending on its centrality for the discourse. It is partly up to the speaker which participant in a proposition to rank as more central (proximate vs. obviative); however, in most cases, the ranking comes from a scale specific to the language and identical for all of its speakers. While a speaker may decide which one of two 3rd-person arguments is more salient, an SAP argument is always ranked higher than a 3rd-person one; the same relation holds true within the SAP domain with the 2nd person always outranking the 1st.

The hierarchy in (1.6) is reiterated here in a slightly modified form:

(2.2) 2 » 1 » 3 » 3' » 3" [3] » inanimate

This salience hierarchy is central for the choice of agreement affixes. Thus, in the prefix position, a second person will always be marked regardless of the presence of any (!) other arguments in the proposition. That has a significant implication for the system of grammatical rules used to produce verbal forms: the rules are ordered *extrinsically*, i.e.

[3] 3' and 3" stand for 'obviative' and 'further obviative' respectively

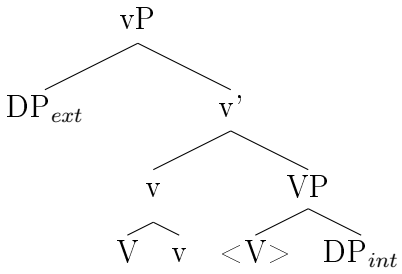
it's not always the case that the most specific vocabulary item will be inserted into a terminal node in a sentence-structure tree. The personal agreement affix /ki-/ specified only with one feature – { +2 } – is the first one which the system will try to insert into one of the agreement slots, disregarding the fact that there are other morphemes that would satisfy their insertion criteria and actually be more specific, i.e. bear more morpho-syntactic features.

This preference for the insertion of the second-person marker, however, is not the primary effect caused by the salience hierarchy encoded in the language's grammar. Much more important is the interplay of this hierarchy and the conditions governing the insertion of *direction (case) markers*. This phenomenon will be addressed in a detailed manner in Sections 8 and 9. For the time being, I will only mention briefly that what seems to be a hierarchy effect concerning the insertion of the 2nd-person affix /ki-/ can also be derived by postulating rule application in blocks (Section 4). In this case, the necessity of extrinsic rule ordering may be readdressed.

2.2 Inverse Morphology

Plains Cree and other Algonquian languages are often said to make use of the so-called *inverse morphology*. At the core of this concept lies the basic necessity to ensure proper argument realization in predications with more than one core argument. A standard transitive predication can be visualized in the following tree (structure borrowed directly from Adger 2003):

(2.3)



The verbal projection initially selects the *internal* argument and then the *external* one (if we assume the UTAH principle outlined in Adger 2003). In canonically transitive cases, the internal argument is assigned the ϑ-role of a patient, and the external argument is in the agentive role. Once the appropriate lexical entries have been inserted and the structure appears on the surface, the listener's parsing apparatus needs a mechanism to identify which of the two arguments to treat as the agent/patient. It has already been mentioned that the simplest way out may be introducing a rigid order of constituents, i.e. to impose a constraint on the language's syntax which would prohibit scrambling the arguments out of their initial positions. In a structure with the branching principle shown above, this would yield a language with a rigid SVO order. A listener will then interpret the DP located on the left side of the verb as the agent and the other one as the patient. Another common strategy used instead of or alongside linear ordering is nominal case marking. In this case, a nominal phrase carries a flag (which may be expressed in different ways on the surface) indicating its syntactic function. Thus, in Lithuanian, every internal argument of a transitive verb is obligatorily marked for the accusative (genitive in some cases), and the external one is normally in the nominative case. This is achieved with the help of bound inflectional affixes attached to nouns, adjectives and determiners.

(2.4) Lithuanian (own data)

a. Tom-as mat-o Jon-ą
PN-NOM see-SBJ.3.PRS PN-ACC
'Tom sees John.'

b. Jon-as mat-o Tom-ą
PN-NOM see-SBJ.3.PRS PN-ACC
'John sees Tom.'

c. mat-o Jon-as Tom-ą
see-SBJ.3.PRS PN-NOM PN-ACC
'John sees Tom.'

d. Tom-ą Jon-as mat-o
PN-ACC PN-NOM see-SBJ.3.PRS
'John sees Tom.'

...

The order of words in Lithuanian is relatively free. While the various linearization patterns may be deemed as more or less natural by native speakers, they all are grammatically well-formed and, stripped of their pragmatic content, represent semantically the same basic proposition: **TRUE iff SEE(j,t)**.

As I already mentioned in the Introduction, case morphology on nominal phrases is called *dependent marking*; that is, a predicate marks the syntactic roles on its dependents. In addition to or instead of dependent marking, a language may employ a *head-marking* strategy, i.e. a system where the verb agrees with its arguments reflecting all or some of their φ-features, as well as their syntactic roles. Thus, in Lithuanian, a finite verb must agree with its external (or only) argument in person and number.

(2.5) Lithuanian (own data)

a. aš mat-au Tom-ą
1SG.NOM see-SBJ.1SG.PRS PN-ACC
'I see Tom.'

b. Tom-as mat-o mane
PN-NOM see-SBJ.3.PRS 1SG.ACC
'Tom sees me.'

In addition to case flagging on the respective nominal phrases (in this case via suffixation and suppletion), the verb reinforces the distinction between its arguments by idicating via its agreement affix which one of the two arguments is external.

Many languages will have verbs agree with both arguments in the transitive case. For instance, a Georgian verb agrees with both the subject and the object using bound morphology.

(2.6) Georgian (Halle & Marantz 1993:117)

a. gv-xatav-s
1PL.OBJ-draw-3SG.SBJ
'(S)he draws us.'

b. g-xatav
2.OBJ-draw
'I draw you.'

In Georgian, each agreement affix indicates certain φ-features of one of the verb's arguments together with its ϑ-role. In Plains Cree, however, the personal agreement morphology only reflects φ-features and not the thematic roles assigned to the arguments by the predicate. An additional mechanism is employed in order to disambiguiate the argument configuration. An example is provided in (2.7).

(2.7) Plains Cree (Zúñiga 2006:76)

a. ni-seekih-aa-w
1-scare-**DIR**-3.ANIM
'I scare him/her.'

b. ni-seekih-iko-w
1-scare-**INV**-3.ANIM
'(S)he scares me.'

Both arguments – the 1st person singular and the 3rd person singular (animate) – are indicated on the verb via bound affixes: a prefix and a suffix. Each affix reflects certain φ-features of its referent. However, neither one of them is specified for its syntactic function. In both sentences, the affixes look identical. Introducing independent personal pronouns would be of little help since Plains Cree does not mark structural cases on DP's. Moreover, it has a (relatively) free order of words. The solution for this issue is the introduction of two additional morphemes inserted into the structure of the verb. In the glosses, they are referred to as DIR(ect) and INV(erse) respectively.

In order to understand their function, one should be reminded of the *ontological salience hierarchy* mentioned above in the previous subsection. According to this hierarchy, the two arguments in the propositions above will always be located on two different hierarchy levels since SAP arguments are intrinsically treated as more salient/central for the discouse than any (!) third-person arguments. So, in the sentences above, the language-specific salience order basically says the following: 1 » 3.

It is therefore assumed by the speaker/listener that, in a transitive predication, a 1st-person participant should canonically be the subject, while a less salient participant is more likely to be the object. **In other words, an agentive argument is expected to be more central within the current discourse parameters than a patient-like one.**

Of course, one can easily imagine a configuration where this would simply not hold true. There are many propositions where a 3rd-person agent does something to an SAP undergoer. If one is unfortunate enough, he or she might be killed by a falling piece of rock. In fact, we can make this English sentence active and say, "A piece of falling rock killed him." In this case, the argument configuration, i.e. 3>1, is misaligned with the ontological salience hierarchy, should we need to translate this sentence into Plains Cree. This misalignment is reflected on the surface via a special *inverse* marker, while a proper alignment is reinforced by a *direct* morpheme.

☞ Thus, the special *inverse morphology* indicates whether the agent/patient configuration matches the relative location of the two arguments on the salience scale.

The inverse pattern observed in Cree and other Algonquian languages is a fairly rare typological feature. It is found in some other Native American languages, as well as a handful of Tibeto-Burman languages in Asia. Most languages with the inverse pattern are notoriously strictly head-marking (Klainman 1992), i.e. they tend to not use case

flagging on DP's. In an idealized case, the direct/inverse configuration would have the following shape:

(2.8) Arg1 Arg2 V-φ1-φ2-**DIR/INV**

In this case, the agreement affixes would reflect only the independent features of the argument DP's, typically gender/person/number. The *directionality* marker would then indicate the way the two scales are aligned. Let's assume that, in a hypothetical inverse language, the 1st person is ranked above the 2nd person in the salience hierarchy. The propositions "I see you" and "You see me" could have the following shapes (with random morpheme linearizations):

(2.9) 1SG-2SG-see-DIR
1SG-2SG-see-INV

Unfortunately, this idealized scheme does not really occur in its pure form in any of the languages for which the inverse pattern has been postulated. While the individual agreement morphemes do indeed display only the φ-features of the respective arguments, the directional affixes frequently encode not only directionality, but also partial information about the argument configuration, in a way reinforcing the information previously provided by the agreement morphology.

Thus, the direct morpheme in Plains Cree has the form /-ee/ or /-aa/ depending on whether the agent is SAP or not. In local scenarios, i.e. 1>2 or 2>1, the directional affixes are completely distinct from non-local and mixed scenarios and seem to be (at the first glance) portmanteau formatives indicating within one morph the entire subject/object configuration.

These complications naturally pose questions concerning the very nature of 'inverseness'. Klaiman et al. (1992) proposes a series of criteria which can be used cross-linguistically in order to determine a language's adherence to the so-called *inverse type*, as well as its relative location within the boundaries of the type. In this work, I will not be analyzing Plains Cree according to these criteria.

☞ My primary goal is assessing the necessity of a special morpho-syntatic feature encoding the inverse configuration of arguments.

In minimalist approaches to analyzing the grammar of natural languages, it is desirable to limit the number of morpho-syntactic features used to capture the grammatical phenomena displayed by a language. This seems only plausible if one assumes maximal economy in order to make it possible for a child's brain to acquire linguistic structures quickly and with minimal effort. It is more 'frugal' to use one feature twice in different contexts than to introduce a different feature for every single phenomenon. It is therefore frequently assumed that the traditional categories used in descriptive grammars are decomposable into further primitives. Thus, the system of German case declension can be captured by using just two binary features instead of four privative ones (Müller 2007):

- NOM: { –obj –obl }
- ACC: { +obj –obl }
- DAT: { +obj +obl }
- GEN: { –obj +obl }

Combining primitive features to capture grammatical categories serves more than just the one purpose of minimizing the amount of atomic categories our brains need to learn. It also helps capture certain phenomena such as syncretisms (identical surface forms in

distinct paradigm cells) or form similarity based on function similarity. Four different cases in German create four disjoint environments. On the other hand, by using the primivite binary features listed above, one can form *natural classes* and, by doing that, capture certain structural patterns observed in the language.

When speaking in terms of primitive binary features, one could come up with a question relevant for the inverse linking pattern: how is 'inverseness' represented on the featural level? Is there a feature { ±inv } which indicates *grammatical function swapping*? If not, how does one explain the phenomena observed on the surface in the languages belonging to this type?

In the sections to follow, I will show how inverse morphology in Plains Cree can be analyzed as a version of *distributed case marking*. I will move along the lines of the idea presented in Wunderlich 2005 and then propose an analysis of verbal agreement in Plains Cree within the framework of Distributed Morphology (Halle & Marantz 2003, 2004), with a few additional concepts.

3 Plains Cree: VTA Agreement Paradigms

In the previous section, I mentioned briefly the existence of different verb classes in Plains Cree grouped according to the gender properties of the arguments that they select. Thus, intransitive verbs are either animate or inanimate depending on the type of their only core argument. Transitive verb stems select animate or inanimate internal arguments. The external argument may be of any type.

Intransitive verbs only agree with one argument (the only one). Therefore, the inverse morphology phenomenon cannot be observed there. I will return to intransitive verbs in Section 11 to see what appears in their case-marking slot.

Transitive inanimate verbs (VTI) are practically always 'direct' by definition since their internal argument is always inanimate, and that corresponds to the lowest rank on the salience scale.

Transitive animate verbs (VTA) are the group which demonstrates the inverse pattern visibly. All combinations of arguments are possible here, including those with an inanimate subject acting on an animate object (the object is, per definition, always animate in this group).

The scope of this work doesn't allow to capture the entire diversity of forms in Plains Cree. I will therefore focus on the morphology used in the so-called *independent order* (most types of matrix clauses).

The inflectional affixes of Plains Cree are situated in multiple inflectional slots, most of them on the right-hand side of the verb's stem. Only one prefix slot is available for agreement morphology in the independent forms.

Table 3.1. The basic verb template in Plains Cree (adopted from Zúñiga 2006)

Slot		Affix	Context
-1	a	ki-	presence of a 2nd-person argument
-1	b	ni-	presence of a 1st-person argument
0	a	V	verb stem
1	a	-im	*strong direct:* SAP>3' / 3 > 3"
2	a	-i	DIR: 2>1
2	b	-iti	INV: 1>2
2	c	-aa	DIR: SAP>3
2	d	-ee	DIR: 3>3' / 3' > 3"
2	e	-iko	INV: elsewhere
3	a	-iji	3'>SAP.SG / 3'>3" / 3">3'
4	a	TAM	
5	a	-naan	presence of a 1.PL argument
5	b	-naw	presence of a 12 argument
5	c	-waaw	presence of a 2.PL argument
5	d	-w	presence of a 3.ANIM argument
5	e	-n	presence of a SAP.SG argument
6	a	TAM	
7	a	-ak	presence of a 3.PL argument
7	b	-Ø	presence of a 3 argument
7	c	-a	presence of a 3'/3" argument
8	a	TAM	

In almost all of the agreement slots, there is a range of competing affixes. In this case, the ones ordered higher in the table are prioritized. That is, the search algorithm moves from top to bottom and stops after finding the first matching candidate.

Slot -1 is reserved for SAP arguments. Regardless of its ϑ-role, a 2nd-person argument will always be marked with /ki-/. This applies to all 2SG, 2PL and 12 arguments. If the 2nd person is not present in the configuration, an argument in the 1st person may be marked with /ni-/, if present. In non-local scenarios, the slot remains empty.

In Slot 5, the basic hierarchy of Plains Cree is slightly violated. Here, 1st-person arguments in the plural are preferred. If none are found, the algorithm inquires for a 2nd-person plural argument. That not being available, a 3.ANIM argument will be marked (in most cases). The last resort option, the affix /-n/, will appear only in local singular scenarios (1SG>2SG or 2SG>1SG), as well as in the scenario INAN>1/2.SG. This preference allows for plurality to be marked more adequately in local scenarios, and this is also the place where SAP plurality shows up in mixed scenarios.

Slot 7 is reserved for 3rd-person arguments only. The plurality of a proximate 3rd-person argument is reflected by the affix /-ak/. Otherwise, an obviative 3rd-person argument may be indicated by an /-a/, but only if there are no proximate third-person arguments.

The three slots which are of primary interest for this study are the ones marked in pink (1, 2, 3). These are the slots where the *inverse pattern* is implemented. These three

slots serve the purpose of encoding which one of the arguments is in the agentive role and which one is the patient. The φ-features of the arguments can be identified fairly unambiguously (there are only a couple of isolated cases of syncretic constellations, such as 2SG>1PL <> 2PL>1PL, which can be seen in the table below) by analyzing the content of slots -1, 5 and 7. However, these affixes only tell the listener about 'who is involved', nothing of the kind 'who is acting out on whom'.

The main inflectional slot serving the purpose of providing this crucial information is Slot 2. Here, 2 groups of morphemes can be distinguished:

- the morphemes /-i/ and /-iti/ used only in local scenarios (often called *direct* and *inverse*, as well);
- the morphemes /-aa/, /-ee/ and /-iko/ which are at work in mixed and local scenarios.

The vocabulary items 2.c and 2.d are considered to be allomorphs in some sources. However, I will assume that the difference in form is bound to a difference in meaning in this case, as well. The morpheme /-aa/ marks a *direct* mixed scenario, i.e. SAP>3('). The morpheme /-ee/ marks a *direct* non-local scenario, i.e. a configuration with two 3rd-person participants, where the agentive argument has a higher salience status than the patient.

The other configurations are *inverse* (suffix /-iko/). These are mixed and non-local scenarios where the agentive argument is ranked below the patient on the salience scale.

The morpheme /-im/ in Slot 1 reinforces the direct suffixes /-aa/ and /-ee/ in situations, where the patient is further down on the hierarchy scale than just one level below the agent.

A further morpheme – /-iji/ – marks an obviative agent in a range of very specific configurations. This morpheme poses a challenge for the analysis because of its 'pickiness'.

The entire conjugation paradigm is presented below.

Table 3.2. Plains Cree: VTA conjugation paradigm

DIRECT		INVERSE	
Local Scenarios			
2SG>1SG	ki-V-Ø-i-Ø-n-Ø	1SG>2SG	ki-V-Ø-iti-Ø-n-Ø
2SG/PL>1PL[4]	ki-V-Ø-i-Ø-naan-Ø	1PL>2SG/PL	ki-V-Ø-iti-Ø-naan-Ø
2PL>1SG	ki-V-Ø-i-Ø-waaw-Ø	1SG>2PL	ki-V-Ø-iti-Ø-waaw-Ø
Mixed Scenarios			
2SG>3SG	ki-V-Ø-aa-Ø-w-Ø	3SG>2SG	ki-V-Ø-iko-Ø-w-Ø
2SG>3PL	ki-V-Ø-aa-Ø-w-ak	3PL>2SG	ki-V-Ø-iko-Ø-w-ak
2SG>3'	ki-V-im-aa-Ø-w-a	3'>2SG	ki-V-Ø-iko-iji-w-a
2PL>3SG	ki-V-Ø-aa-Ø-waaw-Ø	3SG>2PL	ki-V-Ø-iko-Ø-waaw-Ø
2PL>3PL	ki-V-Ø-aa-Ø-waaw-ak	3PL>2PL	ki-V-Ø-iko-Ø-waaw-ak
2PL>3'	ki-V-im-aa-Ø-waaw-a	3'>2PL	ki-V-Ø-iko-Ø-waaw-a
1SG>3SG	ni-V-Ø-aa-Ø-w-Ø	3SG>1SG	ni-V-Ø-iko-Ø-w-Ø
1SG>3PL	ni-V-Ø-aa-Ø-w-ak	3PL>1SG	ni-V-Ø-iko-Ø-w-ak
1SG>3'	ni-V-im-aa-Ø-w-a	3'>1SG	ni-V-Ø-iko-iji-w-a
1PL>3SG	ni-V-Ø-aa-Ø-naan-Ø	3SG>1PL	ni-V-Ø-iko-Ø-naan-Ø
1PL>3PL	ni-V-Ø-aa-Ø-naan-ak	3PL>1PL	ni-V-Ø-iko-Ø-naan-ak
1PL>3'	ni-V-im-aa-Ø-naan-a	3'>1PL	ni-V-Ø-iko-Ø-naan-a
12>3SG	ki-V-Ø-aa-Ø-naw-Ø	3SG>12	ki-V-Ø-iko-Ø-naw-Ø
12>3PL	ki-V-Ø-aa-Ø-naw-ak	3PL>12	ki-V-Ø-iko-Ø-naw-ak
12>3'	ki-V-im-aa-Ø-naw-a	3'>12	ki-V-Ø-iko-Ø-naw-a
Non-Local Scenarios			
3SG>3'	Ø-V-Ø-ee-Ø-w-Ø	3'>3SG	Ø-V-Ø-iko-Ø-w-Ø
3PL>3'	Ø-V-Ø-ee-Ø-w-ak	3'>3PL	Ø-V-Ø-iko-Ø-w-ak
3SG>3"	Ø-V-im-ee-Ø-w-Ø	N/A	N/A
3PL>3"	Ø-V-im-ee-Ø-w-ak	N/A	N/A
3'>3"	Ø-V-Ø-ee-iji-w-a	3">3'	Ø-V-Ø-iko-iji-w-a
Inanimate Subject			
N/A	N/A	0>1SG	ni-V-Ø-iko-Ø-n-Ø
N/A	N/A	0>1PL	ni-V-Ø-iko-Ø-naan-Ø
N/A	N/A	0>2SG	ki-V-Ø-iko-Ø-n-Ø
N/A	N/A	0>2PL	ki-V-Ø-iko-Ø-waaw-Ø
N/A	N/A	0>12	ki-V-Ø-iko-Ø-naw-Ø
N/A	N/A	0>3SG[5]	Ø-V-Ø-iko-Ø-w-Ø
N/A	N/A	0>3PL	Ø-V-Ø-iko-Ø-w-ak

The morpheme /-iji/ is highlighted in the table above in order to demonstrate clearly the contexts in which is occurs.

[4]syncretism between 2SG and 2PL because SAP plurality can only be marked once.
[5]these two forms are identical with those where the agent is 3'

4 Distributed Morphology

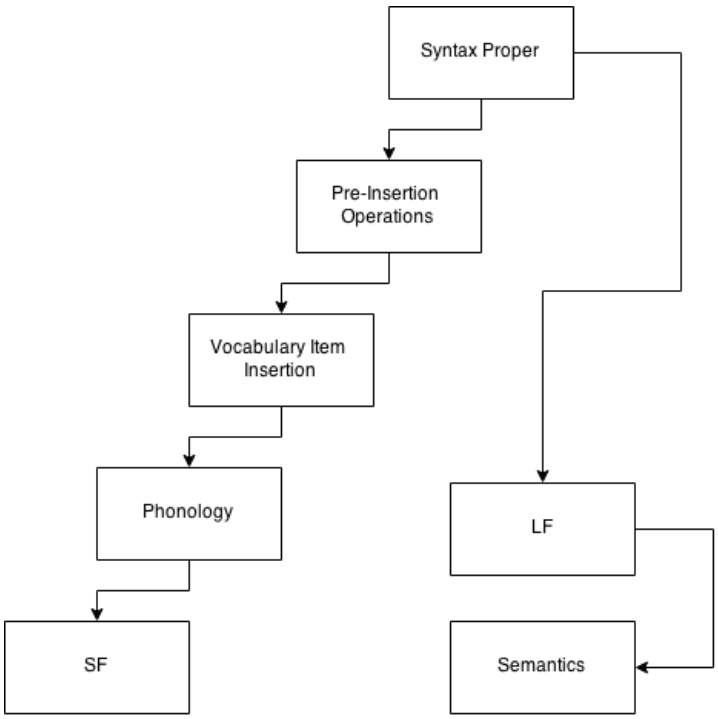
4.1 Basic Concepts

The basic concepts of Distributed Morphology were first outlined by Morris Halle and Alec Marantz (Halle & Marantz 1993, 1994). The main assumption made by them for this particular framework is that, instead of being concentrated in a single grammar module, the machinery of morphology (in the traditional understanding of the term) is distributed among several separate components. The most important principles of DM are presented in the following list:

1. **Late Insertion** :: initially, the terminal nodes inserted into the syntactic structure lack all phonological features, which are supplied later on by vocabulary items (VI) inserted into these slots;
2. **Underspecification** :: the set of morpho-syntactic features carried by a VI doesn't have to include all the features of the terminal node that this VI is inserted into. However, it is normally the most specific VI that is inserted into an inflectional slot;
3. **Syntactic Hierarchical Structure All the Way Down** :: the terminal nodes into which VI's are inserted are organized in a hierarchical manner according to syntactic rules (i.e. morphemes are the terminal nodes of the extended syntactic structure of a clause).

The general structure of Grammar within the DM framework is presented in Fig. 4.1.

Fig. 4.1. A structure of Grammar in DM



After Syntax Proper, further operations may be performed on projection heads in order to achieve the desired structure before Vocabulary Insertion takes place.

While Lowering is generally not possible in most of the modern syntactic theories, it may be performed before Vocabulary Insertion and after Syntax Proper has completed its algorithms. It is often assumed that the Agr head is originally attached close to the root of the clausal tree and then lowered into a position adjacent to that of the v-head (this explains the typologically common location of agreement markers adjacent to the finite verb).

A crucial component of DM is the operation of *Impoverishment*. This is the main means of capturing grammatic syncretisms. Impoverishment is a procedure which deletes morpho-syntactic features in particular contexts, making these contexts more general. In these configurations, highly specific markers cannot be inserted since they violate the strict *Subset Principle* (i.e. the morpho-syntactic features of a VI must realize a subset of the morpho-syntactic features of the terminal node this VI is inserted into). The subsequent insertion of a less specific VI is called *Retreat to the General Case*. Apart from being used to capture syncretisms, impoverishment rules can provide an adequate account for other phenomena, e.g. the absence of certain categories in specific contexts etc. In this study, Impoverishment will serve as the base for the postulated system of differential case marking.

In addition to Impoverishment, two further feature-manipulating operations will be employed:

1. Feature adjustment (analogical to feature adjustment rules employed in phonological transformation rules while deriving a SR based on a UR). In this case, the value of a feature may be changed;
2. Enrichment (as defined in Müller 2007): doubling of valued features in certain contexts in order to make it possible for a feature to be used twice by two different rules (this operation is necessary because of the basic assumption stating that a discharged feature is unaccessible for further insertions).

While lowering syntactic heads and placing them within new positions in the hierarchy of projections, it is important to differentiate between the operations *Merger* and *Fusion*. The operation *Morphological Merger* is defined as follows (adopted from Halle & Marantz 1993):

> *At any level of syntactic analysis (d-structure, s-structure, phonological structure), a relation between X and Y may be replaced by (expressed by) the affixation of the lexical head of X to the lexical head of Y.*

The operation *Fusion* is defined as follows (adopted from Halle & Marantz 1993):

> *Two nodes that have undergone Morphological Merger or that have been adjoined through syntactic head movement can undergo Fusion, yielding one single node for Vocabulary insertion.*

In DM, every time there is a competition among several candidates for filling a slot in a terminal node of a syntactic tree, the *specificity principle* comes into play, which requires the most specific vocabulary item, i.e. the one with the highest number of morpho-syntactic features, to be inserted into the respective slot. This corresponds neatly to the *Elsewhere Principle / Pāṇini's Principle* if one assumes that vocabulary insertion rules are ordered intrinsically. In the sections to follow, I will argue that the system of verbal agreement in Plains Cree might actually prefer certain vocabulary items which are actually less specific than others. I will use ***extrinsic rule ordering*** in order to favor

certain morphemes over others during the vocabulary insertion cycles. As an alternative, I will propose a feature geometry where the specificity of feature bundles will be based on the position of the respective features in the hierarchy, as well as their values (with positively valued features being more specific than negatively valued ones).

It is normal in Distributed Morphology to expect a highly specific VI to occur in fewer cells within a paradigm, while underspecified markers cover larger (frequently continuous) fields.

The following table illustrates a very simple hypothetical paradigm.

	+β	−β
+α	a	b
−α	b	b

Logically, one would not define three different vocabulary items all with the same underlying representation - /b/. One would specify /a/ as { +α +β }, and /b/ would be a non-specific 'elsewhere' marker. The vocabulary insertion rules would have the following shape:

i. { +α +β } ↔ /a/

ii. { ... } ↔ /b/

It is therefore logical for an analysis within the DM framework to aim at picking out markers that appear in multiple cells throughout an inflection paradigm and arrange them into a class of forms where, due to a lack of more specific morphemes, an unspecific *elsewhere* item will be inserted. However, one should be careful while deeming all such affixes as *unspecific*. There may indeed be situations where, even though a particular morpheme appears in multiple inflectional slots, it is not necessarily for no good reason other than *underspecification*. Sometimes, the occurrence of a morph in multiple paradigm cells is functionally justified, and its presence bears semantic significance. We will see an example of this below.

4.2 Rule Blocks

In this subsection, I will briefly introduce the concept of *rule blocks (batches)*. This concept is partially based on Stump's theory of *Paradigm Function Morphology (PFM)* (Stump 2001:138). The main idea is that VI insertion rules are organized into groups named *Blocks*. Within each block, there are a bunch of rules competing to be inserted into the respective syntactic position. There is only one rule in each block that may be inserted.

Once a block has been processed, the algorithm moves on to the next rule block. In Stump's theory, the rules in each block have access to the same bundle of morphosyntactic features σ. The paradigm function PF(<X,σ>) yields the output <Y',σ>. Inside the paradigm function, multiple realization rules arranged in blocks apply to derive the desired result:

$$(4.1) \quad \mathrm{PF}(\langle X,\sigma\rangle) = \mathrm{RR}_{n,\tau.n,C}(...(\mathrm{RR}_{2,\tau.2,C}(\mathrm{RR}_{1,\tau.1,C}(\langle X,\sigma\rangle))))$$

Each rule possesses a bundle of features τ whose exact specification is, generally speaking, not restricted, as long as σ is a proper extension of τ (Stump 2001:41).

I am going to now incorporate the notion of rule blocks into the DM framework described above, but in a somewhat modified version. In order to achieve this, I will have to assume the alternative definition of the operation *Fission*, adopted from Noyer 1992:

> *After a vocabulary item specified for the features contained in the set β has been inserted into an abstract morpheme M in a terminal node with the bundle of morpho-syntactic features α, the features of M are split into a partition containing the sets β and α-β, such that only the latter set is available for further VI insertions.*

If rules apply in blocks and a VI is inserted in each block, then each block will have access to a continuously shrinking bundle of available morpho-syntactic features.

We will now take a look at a simplified example coming from Modern German.

For the German verbal inflection, one could assume the existence of only one syntactic projection for both temporal marking and subject agreement. The Agr head would then bear both the features of Agr and Infl (see next section for a more detailed account of these abbreviations), for instance:

(4.2) **Agr** [{ +fin +pst –conj –1 +2 –pl }] (for the form "frag-te-st (you asked)")

The first rule block would work on inserting the tense/mood marker /-tə/. The feature +pst would become unavailable for the following block dealing with agreement suffixes. Note that, in German, the 3SG suffix /-t/ is absent in past-tense forms. Since the tense feature is unavailable at the stage where this marker is inserted, an impoverishment rule has to apply before all insertions take place to eliminate the distinction between the 1st and the 3rd person in past (and non-indicative contexts) contexts.

In a very simplified form, the system would look like this (only weak verbs are taken into consideration):

Impoverishment
I1. α1 → Ø / [{ ___ +pst }]
I2. α1 → Ø / [{ ___ +conj }]

Block A
A1. { +pst αconj } ↔ /-tə/
A2. { +conj } ↔ /-ə/

Block B
B1. { –1 –2 –pl } ↔ /-t/
B2. { +1 –pl } ↔ /-ə/
B3. { +2 –pl } ↔ /-st/
B4. { +2 } ↔ /-t/
B5. { +pl } ↔ /-ən/

For the form "(du) fragtest", the following derivation steps can be traced (in the illustrated segment of the tree):

Fig. 4.2. A fragment of a vP in German

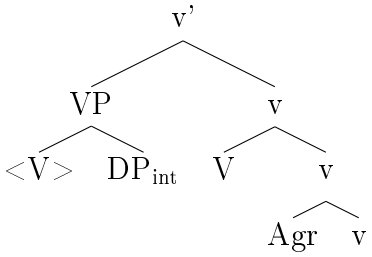


Table 4.1. German tense and agreement morphology at work

2SG.PST	**Feature Bundle**	**Phon. Mat.**
Initial head structure	{ +fin +pst −conj −1 +2 −pl }	
Impoverishment: I1	{ +fin +pst −conj ~~−1~~ +2 −pl }	
Block A: A1	{ +fin +pst −conj ~~−1~~ +2 −pl }	tə
Block B: B3	{ +fin +pst −conj ~~−1~~ +2 −pl }	tə+st
3SG.PST	**Feature Bundle**	**Phon. Mat.**
Initial head structure	{ +fin +pst −conj −1 −2 −pl }	
Impoverishment: I1	{ +fin +pst −conj ~~−1~~ −2 −pl }	
Block A: A1	{ +fin +pst −conj ~~−1~~ −2 −pl }	tə
Block B: N/A	{ +fin +pst −conj ~~−1~~ −2 −pl }	tə
1SG.PST	**Feature Bundle**	**Phon. Mat.**
Initial head structure	{ +fin +pst −conj +1 −2 −pl }	
Impoverishment: I1	{ +fin +pst −conj ~~−1~~ −2 −pl }	
Block A: A1	{ +fin +pst −conj ~~−1~~ −2 −pl }	tə
Block B: N/A	{ +fin +pst −conj ~~−1~~ −2 −pl }	tə

In the second configuration, the [–1] feature is – crucially – not accessible any more! This makes the insertion of /-t/ impossible. There is no other marker that would match the feature configuration in the bundle. Therefore, no affix is inserted. Even though this is not always the case (no insertion at all), it is an example of what I referred to previously as *Retreat to the General Case*.

5 The φ-Features of Arguments

Grammatically, the following types of actants are differentiated in Plains Cree:

- 1 → the speaker (+ further individuals to the exclusion of the addressee);
- 12 → the speaker & the addressee (+ further individuals);
- 2 → the addressee(s);
- 3prox → a non-SAP argument which is highlighted as the salient one in a given context (maximally one per proposition);
- 3obv → a non-SAP argument which is either neutral (in the absence of a proximate argument) or marked as non-central.

In order to capture the underspecified morphemes, we will need to decompose the person categories into bundles of binary features. At least 3 binary features are needed to capture a 5-way opposition. One also has to take into consideration the natural classes that have morphological reflexes. For instance, a very important opposition in Cree is SAP VS. non-SAP. In order to draw a line between these two classes, the binary feature [±part] will be introduced.

The abbreviation 'part' is to be understood as 'participant', i.e. reference to an individual who does participate in the current conversation. In the domain of SAP arguments, we may introduce a [±2] feature to reflect the opposition between the first and second person. However, the following arguments – 12 and 2 – still have the same decomposition pattern:

i. { +part −2 } ↔ 1

ii. { +part +2 } ↔ 12

iii. { +part +2 } ↔ 2

iv. { −part −2 } ↔ 3prox

v. { −part −2 } ↔ 3obv

Moreover, the non-SAP argument types both has the same specification, i.e. their proximity status is not reflected. In a minimalist approach, it would of course be reasonable to try and introduce only one additional feature which would help fill in the two remaining gaps in the system ([±γ] in the most abstract sense). A first-person feature will do great in discriminating 12 and 2, but it would not at all be helpful in the domain of non-SAP arguments. Therefore, a different feature is needed. The feature suggested in this work is [±prox]. While one could try and apply this feature into the SAP domain in order to distinguish between 12 and 2, but it is indeed difficult to logically motivate it in an elegant enough manner. Therefore, both [±1] and [±prox] will be used in this work. While it may not be exactly minimal, it is at least logical.

i. { +part −2 +1 +prox } ↔ 1

ii. { +part +2 +1 +prox } ↔ 12

iii. { +part +2 −1 +prox } ↔ 2

iv. { −part −2 −1 +prox } ↔ 3prox

v. { −part −2 −1 −prox } ↔ 3obv

For the so-called 'further obviative' category (an entity dependent on an obviative one), the feature { ±dep } will be introduced: { −part −2 −1 −prox +dep } ↔ 3obv'.

Since there are only two numbers in plains cree, the binary feature [±pl] will totally suffice.

The feature [±an] distinguishing the two genders of Plains Cree may seem to not be immediately necessary in VTA predications, but it definitely is an important feature if one looks at the big picture. There are, for instance, immediate implications for nominal morphology.

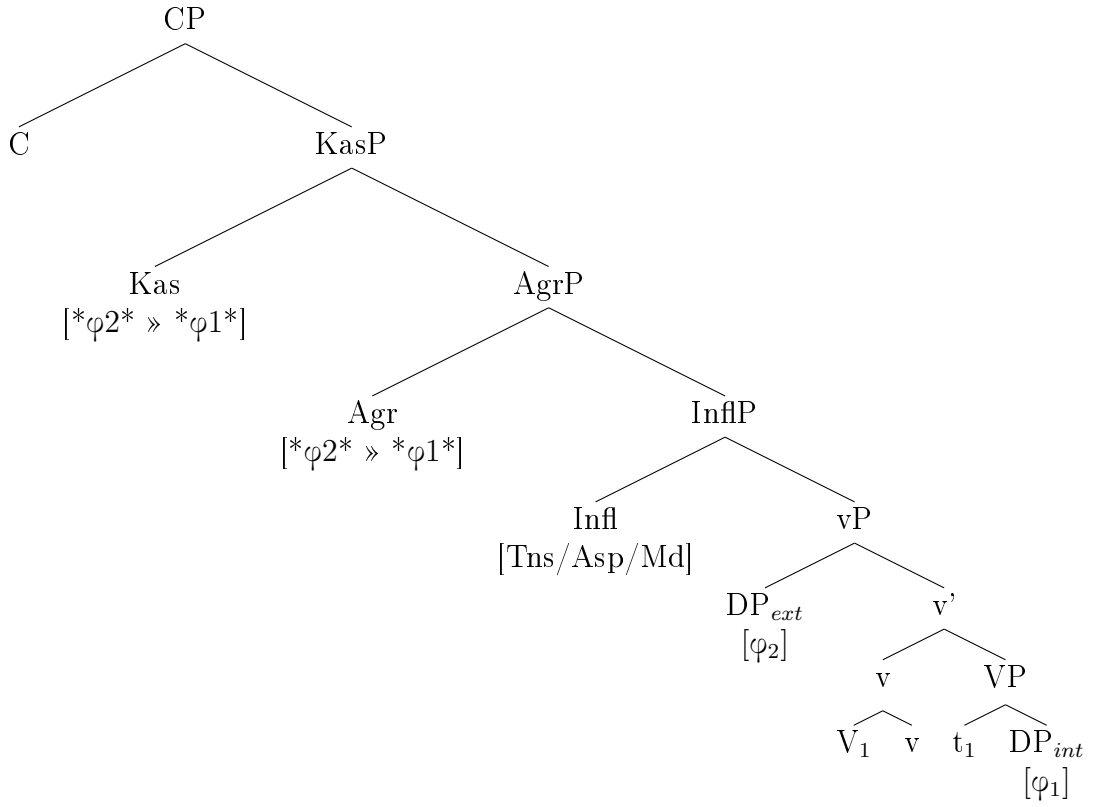
6 On the Syntactic Structure

In this section, the deep syntactic structure of a Plains Cree matrix will be discussed, as well as the subsequent operations preceding the insertion of morphological markers. I assume the basic minimalist structure following the guidelines of such fundamental works as Adger 2003. The main assumptions made here are:

* the syntactic structure is build according to the bottom-up principle. The basic two operations are *Merge* and *Agree* as defined in Adger 2003;
* the verbal projection consists of the lexical verb's projection dominated by the functional v-head: [$_{vP}$ ... v V ... [$_{VP}$ ... <V> ...]];
* the core arguments of a transitive predication are merged in the following positions: Compl-V (internal) and Spec-v (external). The approach including the functional head *v* allows for all the arguments of a predicating verb to be included within the extended verbal phrase (vP), included di-transitive configurations;
* the vP is dominated by a range of functional heads serving the purpose of temporal location, modality, predicate-argument agreement etc. The clausal structure is complete once the C-head has merged in and the CP projection is complete.

The figure presented below illustrates the basic minimal syntactic structure that I assume for Plains Cree matrix clauses.

Fig. 6.1. The deep structure generated by Syntax Proper



The functional head *Agr* receives φ-features from both arguments via trivial downward probing. The closer goal is the external DP, with which the head agrees first. The internal

DP is reached afterwards. Once all the probing features have been discharged, the inner content of the head has the following structure:

Agr [*φ* » *φ*] ➤
Agr [{ ±2 ±dem ±obv ±dep ±pl } { ±2 ±dem ±obv ±dep ±pl }]

The important assumption I am making here is that the two feature bundles are kept separate from each other, as opposed to having a totally unordered 'bag of features' with both arguments collapsed in one common 'pool'. While the basic features have a one-level structure (following Adger 2011), the functional heads have sets as members of their specification sets.

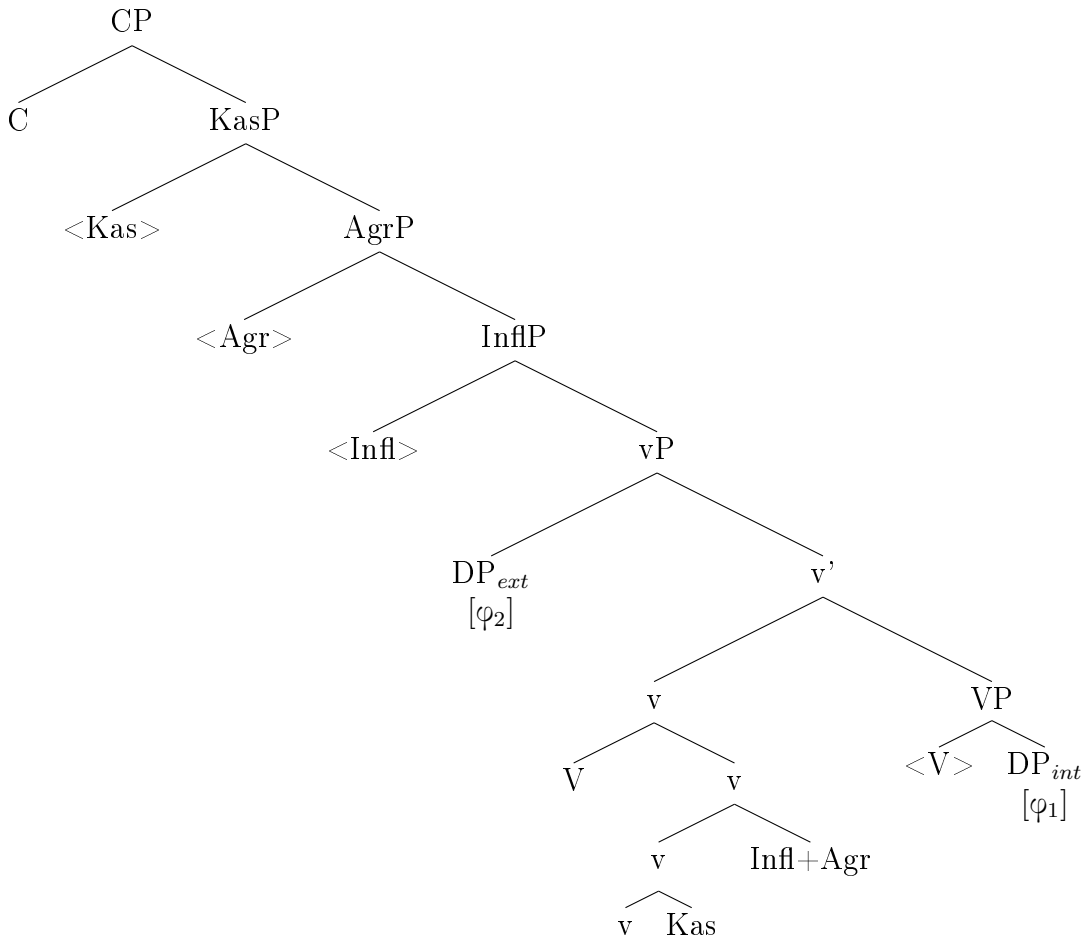
After being lowered, the Agr head is merged and subsequently fused with the Infl head.

The functional head *Kas(us)* (i.e. case) also probes for both arguments' φ-features. In addition to that, it adds the feature [+subj] to the bundle representing the external argument and the feature [–subj] to the internal argument.

Kas [{ +subj *φ* } » { –subj *φ* }] ➤
Kas [{ +subj ±2 ±dem ±obv ±dep ±pl } { –subj ±2 ±dem ±obv ±dep ±pl }]

The *Kas* head is post-syntactically merged with *v* below *Infl+Agr*. The resulting syntactic structure will have the shape provided in the figure below.

Fig. 6.2. The pre-insertion structure



Once this final structure has been generated, the vocabulary insertion mechanism takes over. In the fused *Infl+Agr* head, the VI insertion rules apply in several disjoint rule

blocks. The cycle inserting TAM-specific morphemes alternate with those inserting agreement affixes. The entire procedure has the following schematic representation:

TAM Block A → Agr Block A,B → TAM Block B → Agr Block C → TAM Block C.

The insertions in these cycles represent the inflectional Slots 4, 5, 6, 7 and 8. The TAM insertion cycles will be ignored in this study. What exactly happens with the *Kas* head (as well as the reason why I choose to explicitly call it *Kasus*) will be discussed extensively in Section 9.

Before we address the DIR/INV opposition in Plains Cree, I would like to provide a quick overview of how the basic, ϑ-unspecific agreement affixes are inserted. Section 7 is thus dedicated to Slots -1, 5, and 7 in the verb template.

7 AGR: Vocabulary Item Insertion

The Agr vocabulary items provide information about the argument configuration in the current predication. There are two primary slots for these affixes (5 and 7), plus one prefix position. We will assume that the insertion of the prefix takes place in the normal Agr position with the morpheme being specified phonologically for its positional preferences. That way, it will automatically move to the left end of the phonological unit once the structure is passed on to the phonological mechanism.

In some configurations, e.g. 1pl.excl » 3prox.sg, the feature { +part } will have to be used twice: once for the prefix and once for the affix in Slot 5. Therefore, the { ±part } feature should be doubled using a special enrichment rule (Müller 2007).

Enrichment rule: Ø → αpart / _____ αpart

The insertion rules are ordered according to their specificity (described in detail in Sectin 9 using the basic *Elsewehere Principle*, as well as a feature geometry).

Agr Block A

i. { +2 } ↔ /ki-/

ii. { +1 } ↔ /ni-/

Agr Block B

i. { +part −2 +pl } ↔ /-naan/

ii. { +part +1 +pl } ↔ /-naw/

iii. { +part +pl } ↔ /-waaw/

iv. { −part } ↔ /-w/

v. { ... } ↔ /-n/

Agr Block C

i. { −part +prox +pl } ↔ /-ak/

ii. **{ −part +prox }** ↔ **/-Ø/** *(could be replaced by a special command of the type "break")*

iii. { −part −prox } ↔ /-a/

Rule *ii* in Block C has some implications for the theory. It assumes the existence of null morphemes which are not just 'elsewhere' cases, but are overtly specified via a particular feature bundle. This is not everybody's favorite concept, particularly if we assume the *Iconicity Principle* where semantically non-empty units are supposed to contain phonological material. The heavier the feature bundle, the more overtly pronounced material is expected.

7.1 Morpheme Insertion - Local Scenarios

The pre-insertion head had the following structure:

AGR
{ +part +part ±2 ±1 +prox –dep ±pl }
{ +part +part ±2 ±1 +prox –dep ±pl }

After the insertion of the personal markers in Blocks A & B, the following scenarios are possible (Block C never causes an insertion in these configurations):

Table 7.1. Agreement affixes in local scenarios

1sg:2sg	{ –2 +1 +part +part +prox –dep –pl } { +2 –1 +part +part +prox –dep –pl }	ki- ... -n
1sg:2pl	{ –2 +1 +part +part +prox –dep –pl } { +2 –1 +part +part +prox –dep +pl }	ki- ... -waaw
1pl:2sg	{ –2 +1 +part +part +prox –dep +pl } { +2 –1 +part +part +prox –dep –pl }	ki- ... -naan
1pl:2pl	{ –2 +1 +part +part +prox –dep +pl } { +2 –1 +part +part +prox –dep +pl }	ki- ... -naan

The latter two rows syncretise because the insertion of the 1pl marker overrides the necessity to mark the number distinction on the 2nd-person argument.

7.2 Morpheme Insertion - Mixed and Non-Local Scenarios

In a non-local or mixed scenario, Slot 7 will always be filled, in some cases by a specific zero-marker. In some of these scenarios, it can be seen how some of the [±part] features need to be discharged twice – by the application of two different rules from two different blocks.

Table 7.2. Mixed scenarios (after Blocks A, B & C)

1sg:3prox.sg	{ –2 +1 +part +part +prox –dep –pl } { –2 –1 –part –part +prox –dep –pl }	ni- ... -w-Ø
1sg:3prox.pl	{ –2 +1 +part +part +prox –dep –pl } { –2 –1 –part –part +prox –dep +pl }	ni- ... -w-ak
1sg:3obv	{ –2 +1 +part +part +prox –dep –pl } { –2 –1 –part –part –prox –dep }	ni- ... -w-a

1pl:3prox.sg	{ –2 +1 +part +part +prox –dep +pl } { –2 –1 –part –part +prox –dep –pl }	ni- … -naan-Ø
1pl:3prox.pl	{ –2 +1 +part +part +prox –dep +pl } { –2 –1 –part –part +prox –dep +pl }	ni- … -naan-ak
1pl:3obv	{ –2 +1 +part +part +prox –dep +pl } { –2 –1 –part –part –prox –dep }	ni- … -naan-a
12:3prox.sg	{ +2 +1 +part +part +prox –dep +pl } { –2 –1 –part –part +prox –dep –pl }	ki- … -naw-Ø
12:3prox.pl	{ +2 +1 +part +part +prox –dep +pl } { –2 –1 –part –part +prox –dep +pl }	ki- … -naw-ak
12:3obv	{ +2 +1 +part +part +prox –dep +pl } { –2 –1 –part –part –prox –dep }	ki- … -naw-a
2sg:3prox.sg	{ +2 –1 +part +part +prox –dep –pl } { –2 –1 –part –part +prox –dep –pl }	ki- … -w-Ø
2sg:3prox.pl	{ +2 –1 +part +part +prox –dep –pl } { –2 –1 –part –part +prox –dep +pl }	ki- … -w-ak
2sg:3obv	{ +2 –1 +part +part +prox –dep –pl } { –2 –1 –part –part –prox –dep }	ki- … -w-a
2pl:3prox.sg	{ +2 –1 +part +part +prox –dep +pl } { –2 –1 –part –part +prox –dep –pl }	ki- … -waaw-Ø
2pl:3prox.pl	{ +2 –1 +part +part +prox –dep +pl } { –2 –1 –part –part +prox –dep +pl }	ki- … -waaw-ak
2pl:3obv	{ +2 –1 +part +part +prox –dep +pl } { –2 –1 –part –part –prox –dep }	ki- … -waaw-a

Table 7.3. Non-local scenarios (after Blocks B & C)

3sg:3’(’)	{ –part –part –2 –1 +prox –dep –pl } { –part –part –2 –1 –prox ±dep }	… -w-Ø
3pl:3’(’)	{ –part –part –2 –1 +prox –dep +pl } { –part –part –2 –1 –prox ±dep }	… -w-ak
3’:3’(’)	{ –part –part –2 –1 –prox –dep } { –part –part –2 –1 –prox ±dep }	… -w-a

8 Inverse Morphology and Differential Case Marking

The challenges of describing and analyzing inverse morphology include the following central questions:

a. How is inverse morphology represented mentally on the deep levels of language parsing / production?

b. How did inverse morphology evolve, i.e. where do its origins lie and what were the prerequisites for its emergence?

One possible approach to analyzing the system exhibited by the Algonquian languages and Cree in particular is based on the considerations presented in this section. Before proceeding to analyzing Plains Cree, a few crucial concepts will be introduced in the paragraphs to come.

8.1 Differential Case Marking

Under *differential case marking*, one should understand a system where the arguments of a predication (a bivalent one in this particular case) carry case markers only in a range of specific contexts defined by the respective language's grammar.

J. Aissen (2002) has the following general description for differential object marking (DOM):

> *It is common for languages with overt case-marking of direct objects to mark some objects, but not others, depending on semantic and pragmatic features of the object. I call this phenomenon DIFFERENTIAL OBJECT MARKING (DOM).*

The contexts in which arguments are overtly marked for case may be determined by hierarchy scales conceptually very close to the ontological salience hierarchies demonstrated by languages like Cree. Different types of potential predication participants are deemed more or less prototypical for the thematic role they are to bear. Thus, SAP arguments are much more likely to be in the agentive role, while 3rd-person arguments (especially indefinite/inanimate/non-specific ones) are typically patients. The following sample hierarchies can thus be established for a hypothetical language L (they fairly closely follow those outlined in Aissen 2003; however, the different dimensions are combined into a linear hierarchy):

* **Agent**: PRO(noun) » HUM(an) » ANIM(ate) » INAN(imate) » NSP [6];
* **Patient**: NSP » INAN » ANIM » HUM » PRO.

Although the opposite directions of the two scales above are intuitively understandable, this can also be derived using the concept of so-called *harmonic alignment* (Prince & Smolensky 2004). In a harmonic alignment scale, the salience hierarchy (here the hypothetical scale presented above) is mapped onto a binary dimension, in this case the ϑ-role hierarchy: Ag(ent) > Pat(ient).

This produces the following formal alignment scales with higher-ranked items being 'better' or 'more desirable' in a language:

[6] non-specific

* Ag/PRO » Ag/HUM » Ag/ANIM » Ag/INAN » Ag/NSP;
* Pat/NSP » Pat/INAN » Pat/ANIM » Pat/HUM » Pat/PRO.

In an OT-based approach (described in detail in Section 12), this would produce the following two sets of markedness constraints:

C1: *Ag/NSP » *Ag/INAN » *Ag/ANIM » *Ag/HUM » *Ag/PRO;

C2: *Pat/PRO » *Pat/HUM » *Pat/ANIM » *Pat/INAN » *Pat/NSP.

These constraints may be later manipulated in order to achieve a hierarchy suitable for deriving a configuration specific to a particular language. More on this will be said in the respective section below. For now, I will move the analysis along the DM lines.

A very simple differential case marking system is at play in Modern Hebrew. The accusative marker /ʔɛt/ is employed in Hebrew only with definite objects, including personal pronouns and personal names.

(8.1) Modern Hebrew (own data)

a.	ʔani	ʁoʔ-ɛ	jɛlɛd
	1SG(M)	see\PRS-M.SG	boy
	'I see a boy.'		
b.	ʔani	ʁoʔ-ɛ	ʔɛt=ha-jɛlɛd
	1SG(M)	see\PRS-M.SG	ACC=DEF-boy
	'I see the boy.'		
c.	ʔani	ʁoʔ-ɛ	ʔɛt=χɛm
	1SG(M)	see\PRS-M.SG	ACC=2PL.M
	'I see you (all).'		
d.	ʔani	ʁoʔ-ɛ	ʔɛt=saʁa
	1SG(M)	see\PRS-M.SG	ACC=PN
	'I see Sarah.'		

Similarly, in Spanish, personal pronouns, as well as personal names, are always marked for the accusative in the patient role. Other DP's remain unmarked.

(8.2) Spanish (data provided kindly by Matías Guzmán Naranjo, University of Leipzig)

a.	ve-o	*(a)	Juan	
	see-PRS.1SG	*(ACC)	Juan	
	'I see Juan.'			
b.	lo/*el	ve-o		
	3SG.M.ACC/*NOM	see-PRS.1SG		
	'I see him.'			
c.	conozc-o	(a)	un	abogado
	know-PRS.1SG	(ACC)	INDEF.M.SG	lawyer(M)
	'I know a lawyer.'			
d.	ve-o	(*a)	un-a	casa
	see-PRS.1SG	(*ACC)	INDEF-F.SG	house(F)
	'I see a house.'			

In Russian, direct objects represented by masculine nouns are only marked for case when they are animate:

(8.3) Russian (own data)

a.	ja	viz̧-u	stol
	1SG.NOM	see\PRS-1SG.SBJ	table(M.INAN)
	'I see a/the table.'		
b.	ja	viz̧-u	ps-a
	1SG.NOM	see\PRS-1SG.SBJ	dog(M.ANIM)-ACC.SG
	'I see a/the dog.'		

However, personal pronouns (which are more salient than nouns) are always marked overtly for the accusative:

(8.4) Russian (own data)

a.	ja	viz̧-u	jevo
	1SG.NOM	see\PRS-1SG.SBJ	3SG.M.ACC
	'I see him (the dog) / it (the table).'		

While Hebrew marks all definite objects, in Russian, they must be animate, and not necessarily definite. This is a minor difference reflecting the particular ways these languages arrange their hierarchical scales. In the bigger picture, the variation in individual languages represents the basic tension of differential case marking: where does a language place the boundary between expressivity and economy.

Differential Subject Marking is statistically more rare than *DOM*. A couple of examples are found in Malchukov 2007. For instance, only inanimate agents (of the neuter gender) take the ERG case in the Mangarayi language, while animate agents (of masculine or feminine genders) do not. An even more interesting pattern is found in Samoan:

(8.5) Samoan (Mosel and Hovdhaugen, 1992:424-5)

a.	na	tapuni	e	le	matagi	le	faitoto'a
	PST	close	ERG	ART	wind	ART	door
	'The wind closed the door.'						
b.	na	tapuni	i	le	matagi	le	faitoto'a
	PST	close	OBL	ART	wind	ART	door
	'The wind closed the door.'						

While the language consistently marks animate agents with the ERG (Malchukov 2007), inanimate ones may optionally carry the ***oblique*** marker instead of the ergative (this is illustrated in the two examples above). [7]

If we, again, turn to OT, we could imagine a constraint of the type *STRUC$_C$ (Aissen 2003) demanding that structural case be always marked. This constraint is placed into a particular position inside the hierarchy of markedness constraints outlined above, indicating where the line is drawn in a particular language.

In a DM-like framework, the crucial post-syntactic operation is *Impoverishment*: it effectively eliminates case features from prototypical arguments. Thus, one could postulate the following impoverishment rule for Russian DP's:

(8.6) [+obj] → Ø / [+m –anim]

[7] As we will shortly see, the oblique marker in Plains Cree also appears with low-salience subjects (in a restricted range of contexts).

The vocabulary items marking the nominative and the accusative could potentially look as follows:

i. { +obj +m +pl } ↔ /-ov/
ii. { +obj +m } ↔ /-a/
iii. { +m +pl } ↔ /-i/
iv. { +m } ↔ Ø

Once the [+obj] feature has been eliminated, the result is the *retreat to the general case*: the less specific affixes will be inserted, normally used for the nominative case.

Fig. 8.1. A fragment of a Russian DP_{int} (masc)

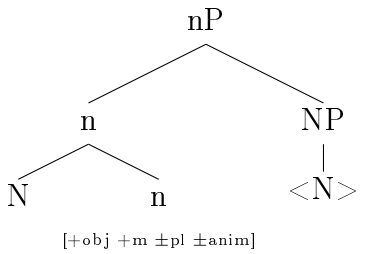


Table 8.1. Case marking in Russian DP's

Stem	Initial n-Structure	After Impoverishment	VI Inserted
/ps/ 'dog'	{ +obj +m –pl +anim }	{ +obj +m –pl +anim }	/ps+a/
/ps/ 'dog'	{ +obj +m +pl +anim }	{ +obj +m +pl +anim }	/ps+ov/
/stol/ 'table'	{ +obj +m –pl –anim }	{ +m –pl –anim }	/stol+Ø/
/stol/ 'table'	{ +obj +m +pl –anim }	{ +m +pl –anim }	/stol+i/

In the following subsection, I would like to introduce a concept, according to which the direction markers in Plains Cree are case markers akin to the morphemes inserted into Russian DP's in the table above.

8.2 Differential Case Marking and Plains Cree

In the paragraphs above, I have spoken briefly about differential case marking on nominal phrases. However, the framework can undoubtedly be extended to head-marking languages, as well. Indeed, head-marking languages exhibit a whole variety of different approaches to argument linking with the individual methods being quite diverse. One finds ergative, accusative and active patterns. Alongside these basic patterns, there are more complex systems with various splits. While many languages agree with both of their arguments, some only have one agreement position reserved for the more salient participant.

In Plains Cree, there are multiple agreement slots. Most of them serve the sole purpose of indicating the presence of a particular argument, without telling the listener anything about its thematic role. Only three agreement slots – 1, 2, and 3 – serve the purpose of disambiguating the argument configuration. Of these three slots, Slot 2 always carries the primary direction-marking morpheme. Slots 1 and 3 are secondary.

If we assume the following hierarchy as the underlying hierarchy at work in Plains Cree – 2 » 1 » 3 » 3' (» 3") » 0 – we can then rank subjects and objects (i.e. agentive and patient-like arguments) as more or less prototypical according to their location on the hierarchy

scale. Thus, SAP arguments are the prototypical subjects which, in a differential case marking system, would not need to bear any overt case morphology. We can use the notation Abs/Nom/Null-Case for this (further abbreviated to Ø). The same applies to third-person patients which will also carry no case markers. So, in SAP>3 scenarios, neither one of the two arguments would appear on the surface with an overt case flag in our hypothetical idealized system. Less typical agents, i.e. those of the third person or inanimate, would have to be marked for the ergative case since their syntactic role is in this case 'unexpected'. Following the same logic, SAP patients would have to be marked for the accusative case in order to be parsed properly. Note that this kind of overt case marking is crucial in languages with free word order. The case marking pattern can be summarized as follows:

- Agent: unmarked if prototypical, Erg otherwise;
- Patient: unmarked if prototypical, Acc otherwise.

The table presented below juxtaposes the so-called *direction markers* of Plains Cree with the differential case marking system outlined in the paragraphs above[8]:

Table 8.2. Case-marking system based on the Plains Cree salience hierarchy

Ag/Pt	3'	3	1	2
2	Ø/Ø :: -aa	Ø/Ø :: -aa	Ø/Acc :: -i	RFL
1	Ø/Ø :: -aa	Ø/Ø :: -aa	RFL	Ø/Acc :: -iti
3	Erg/Ø :: -ee	RFL	Erg/Acc :: -iko	Erg/Acc :: -iko
3'	*rare*	Erg/Ø :: -iko	Erg/Acc :: -iko	Erg/Acc :: -iko
0	Erg/Ø :: -iko	Erg/Ø :: -iko	Erg/Acc :: -iko	Erg/Acc :: -iko

The yellow-shaded area represents the so-called *inverse* domain. The case notions used in the table are the cases used traditionally in linguistic descriptions. However, it is not unthinkable to introduce a finer ranking system where agentive arguments can be marked for more than two different cases depending on their degree of ontological salience. One could imagine a system where three cases – Abs :: Erg :: Obl – would compete as possible markers of the agent-like argument in a proposition. The notion OBL(ique) is to be understood here as a way to refer to an ergative argument additionally carrying the feature { –prox }. A modified version of the table is presented below:

Table 8.3. Case-marking system: revised

Ag/Pt	3'	3	1	2
2	Ø/Ø :: -aa	Ø/Ø :: -aa	Ø/Acc :: -i	RFL
1	Ø/Ø :: -aa	Ø/Ø :: -aa	RFL	Ø/Acc :: -iti
3	Erg/Ø :: -ee	RFL	Erg/Acc :: -iko	Erg/Acc :: -iko
3'	*rare*	Obl/Ø :: -iko	Obl/Acc :: -iko	Obl/Acc :: -iko
0	Obl/Ø :: -iko	Obl/Ø :: -iko	Obl/Acc :: -iko	Obl/Acc :: -iko

Some preliminary inferences that may be drawn from the table above:

1. The affix /-iko/ represents scenarios with ergative and oblique 3rd-person agents;
2. The affixes /-i/ and /-iti/ are accusative markers for SAP arguments;

[8] note that inanimate objects are not represented because they only appear with a specific class of verbs

3. The affix /-aa/ is an absolutive marker / unspecific marker occupying the case slot for the sake of filling it.

The morpheme /-ee/ is a slightly problematic case because it clearly patterns with /-aa/ but has an ergative argument. We will return to it in the following section where I will introduce how exactly direction/case marking works in Plains Cree.

I will be using the syntactic structure from Section 6, and the theoretical framework outlined in Section 4 (DM with the addition *Rule Blocks*, as well as extra operations such as *Feature Enrichment* proposed by Müller and Noyer's concept of *Fission*).

9 Case Alignment Rules

If the case alignment rules were to be outlined strictly according to the general principles described in the section introducing Distributed Morphology, the vocabulary item /-iko/ would be chosen as the *elsewhere marker* due to the fact that it appears in a whole number of cells within the paradigm, which, combined together, form a continuous area in the bottom-right corner of the conjugation table.

One could, however, introduce a different approach to viewing the case alignment table presented in Section 8. In this (possibly more plausible) approach, the affix /-iko/ will be analyzed as one of the specific markers representing the ergative case of a 3rd-person subject. The markers /-i/ and /-iti/ will mark the accusative case of SAP arguments. The marker /-aa/ will represent an absolutive SAP argument.

The elsewhere marker in this scenario will be the morpheme /-ee/. It only appears in a limited number of cells in the paradigm, but it could indeed be viewed as a sort of *retreat to the general (= unmarked) case*: while it is postulated that the language does want to mark ergative third-person subjects, there no point in doing that in constellations where the object is located even further down on the salience scale.

The vocabulary item insertion rules are presented below:

Block A

i { +dep } ↔ /-im/

Block B

i. { −subj −2 +part } ↔ /-i/ (1.ACC)

ii. { −subj +2 } ↔ /-iti/ (2.ACC)

iii. { +subj −part } ↔ /-iko/ (3.ERG)

iv. { +part } ↔ /-aa/ (SAP.ABS)

v. { −part } ↔ /-ee/ (3.ABS)

Block C

i. { +obl } ↔ /-iji/ (3.Obl)

The **impoverishment** rules will have the following shape:

I. +subj → Ø / [{ ___ +part }];

II. −subj → Ø / [{ ___ −part }];

III. +subj → Ø / [{ ___ –part } { +dep }] :: if the other argument is *further* obviative, no ergative marking is necessary;

IV. +subj → Ø / [{ ___ –part +prox } { -part }] :: if the subject is 3prox and the object is also a 3rd-person argument, no ergative marking is needed;

V. –subj → Ø / [{ ___ } { –part }] :: the accusative is not marked in mixed scenarios (this rule will be revised below);

VI. +dep → Ø / [{ ___ } { –prox }]

The last impoverishment rule needs to apply (crucially!) after Rule III, since it could otherwise bleed it. Rule III thus overapplies in the 3'>3" configuration ensuring the insertion of /-ee/ in the presence of a dependent argument, but not the affix /-im/ to reflect this presence. The first two impoverishment rules have no consequences for the system empirically observed in Plains Cree. However, they do have an important theoretical value. Instead of relying solely on the raster of vocabulary items, the system effectively prohibits the appearance of SAP.ERG and 3.ACC morphemes, even if these existed in the affix inventory.

Additionally, there is a feature **adjustment** rule:

I. –dep → +dep / [{ +part +subj } { –prox ___ }] :: ensures the insertion of the morph /-im/ into Slot 1 in SAP:3' congfiguration.

The **enrichment** rules (apply before impoverishment and adjustment):

I. Ø → +obl / [{ ___ +subj –part –prox } { +part –pl }]

II. Ø → +obl / [{ ___ +subj –part –prox } { –part –prox }]

These two enrichment rules introduce an additional *oblique* feature which allows for the insertion of the oblique morph in the scenarios mentioned above.

Table 9.1. The insertion of case-marking affixes

1>2	{ /~~subj~~/ –2 +prox +part ±pl } { –subj +2 +prox +part ±pl }	-iti	2.Acc
1>3	{ /~~subj~~/ –2 +prox +part ±pl } { /~~subj~~/ –2 +prox –part ±pl }	-aa	1/2.Abs
1>3'	{ /~~subj~~/ –2 +prox +part ±pl } { /~~subj~~/ –2 –prox –part +dep }	-im-aa	Dep-1/2.Abs
12>3	{ /~~subj~~/ +2 –prox +part +pl } { /~~subj~~/ –2 +prox –part ±pl }	-aa	1/2.Abs
12>3'	{ /~~subj~~/ +2 –prox +part +pl } { /~~subj~~/ –2 –prox –part +dep }	-im-aa	Dep-1/2.Abs
2>1	{ /~~subj~~/ +2 +prox +part ±pl } { –subj –2 +prox +part ±pl }	-i	1.Acc
2>3	{ /~~subj~~/ +2 +prox +part ±pl } { /~~subj~~/ –2 +prox –part ±pl }	-aa	1/2.Abs
2>3'	{ /~~subj~~/ +2 +prox +part ±pl } { /~~subj~~/ –2 –prox –part +dep }	-im-aa	Dep-1/2.Abs

3>1	{ +subj –2 +prox –part ±pl } { /subj/ –2 +prox +part ±pl }	-iko	3.Erg
3>12	{ +subj –2 +prox –part ±pl } { /subj/ +2 –prox +part +pl }	-iko	3.Erg
3>2	{ +subj –2 +prox –part ±pl } { /subj/ +2 +prox +part ±pl }	-iko	3.Erg
3>3'	{ /subj/ –2 +prox –part ±pl } { /subj/ –2 –prox –part }	-ee	3.Abs
3>3"	{ /subj/ –2 +prox –part ±pl } { /subj/ –2 –prox +dep –part }	-im-ee	Dep-3.Abs
3'>1SG	{ +obl +subj –2 –prox –part } { /subj/ –2 +prox +part –pl }	-iko-iji	3.Erg-3.Obl
3'>1PL	{ +subj –2 –prox –part } { /subj/ –2 +prox +part +pl }	-iko-Ø	3.Erg
3'>12	{ +subj –2 –prox –part } { /subj/ +2 -prox +part +pl }	-iko-Ø	3.Erg
3'>2SG	{ +obl +subj –2 –prox –part } { /subj/ +2 +prox +part –pl }	-iko-iji	3.Erg-3.Obl
3'>2PL	{ +subj –2 –prox –part } { /subj/ +2 +prox +part +pl }	-iko-Ø	3.Erg
3'>3	{ +subj –2 –prox –part } { /subj/ –2 +prox –part ±pl }	-iko-Ø	3.Erg
3'>3"	{ +obl /subj/ –2 –prox –part } { /subj/ –2 –prox /dep/ –part }	-ee-iji	3.Abs-3.Obl[9]
3">3'	{ +obl +subj –2 –prox /dep/ –part } { /subj/ –2 –prox –part }	-iko-iji	3.Erg-3.Obl

As I have mentioned above, the suffixes /-im/ and /-iji/ are secondary alignment markers, the primary morphemes appearing in Slot 2. There are a total of five vocabulary items, only three of them standing for marked cases. Thus, the morphemes /-i/ and /-iti/ mark the accusative case on SAP arguments. The morpheme /-iko/ marks an ergative non-SAP argument. These three markers are therefore reserved for marked, i.e. atypical, configurations (SAP object and/or 3rd-person subject).

The latter two affixes are less specific and mark less extreme cases. We could postulate an assumption that, in a differential case marking system, there are actually no over case markers needed in this scenario; however, the system being such that it prefers always having an overt marker in the grammatical slot which is currently being considered, an absolutive/default case marker will be inserted partially specified for the grammatical person of the argument it marks (/-aa/ VS /-ee/ for SAP vs non-SAP).

Without feature hierarchies, any additional impoverishment, adjustment or enrichment rules, the system would have yielded the following agreement table (if necessary, the

[9] this is a potentially problematic case. The 3.Abs marking appears together with 3.Obl, which may seem illogical.

actual morphemes are additionally indicated):

Table 9.2. Result without impoverishment

Ag/Pt	3”	3’	3	2	1
1	-aa	-aa	-aa	-iti	RFL
2	-aa	-aa	-aa	RFL	-i
3	*-iko -ee	*-iko -ee	RFL	*-iti -iko	*-i -iko
3’	*-iko -ee	*rare*	-iko	*-iti -iko	*-i -iko
3”	N/A	-iko	N/A	N/A	N/A

If we re-arrange the rules for Cycle B extrinsically and place the following rule –

iii. { +subj –part } ↔ /-iko/

– above all others (in other words, we specify extrinsically in the grammar that the 3rd-person ergative marker is to prioritized over all other markers), the table can be improved significantly:

Table 9.3. Resulting chart after rule re-ordering

Ag/Pt	3”	3’	3	2	1
1	-aa	-aa	-aa	-iti	RFL
2	-aa	-aa	-aa	RFL	-i
3	*-iko -ee	*-iko -ee	RFL	-iko	-iko
3’	*-iko -ee	*rare*	-iko	-iko	-iko
3”	N/A	-iko	N/A	N/A	N/A

What this version of the table does not reflect is the differentiation of ‘direct’ and ‘inverse’ scenarios in non-local configurations. Thus, both constellations – 3>3’ and 3’>3 – have a third-person subject, which is exactly the argument that the system prioritizes. However, in direct scenarios where the subject is higher in salience than the object, there is no necessity to used a marked form since this scenario is typical. The impoverishment rules deleting the { +subj } feature in these configurations are therefore crucial.

The rules presented above can be re-written as follows:

Block B

i. { +subj –part } ↔ /-iko/ (3.ERG) :: now ordered at the top
ii. { –subj –2 +part } ↔ /-i/ (1.ACC)
iii. { –subj +2 } ↔ /-iti/ (2.ACC)
iv. { +part } ↔ /-aa/ (SAP.ABS)
v. { –part } ↔ /-ee/ (3.ABS)

The **impoverishment** rules are reduced to the following 5 items:

I. +subj → Ø / [{ ___ +part }]
II. –subj → Ø / [{ ___ –part }]
III. +subj → Ø / [{ ___ –part } { +dep }] :: if the other argument is *further* obviative, no ergative marking is necessary;
IV. +subj → Ø / [{ ___ –part +prox } { –part }] :: if the subject is 3prox and the object is also a 3rd-person argument, no ergative marking is needed;
V. +dep → Ø / [{ ___ } { –prox }]

Table 9.4. The insertion of case-marking affixes: revised

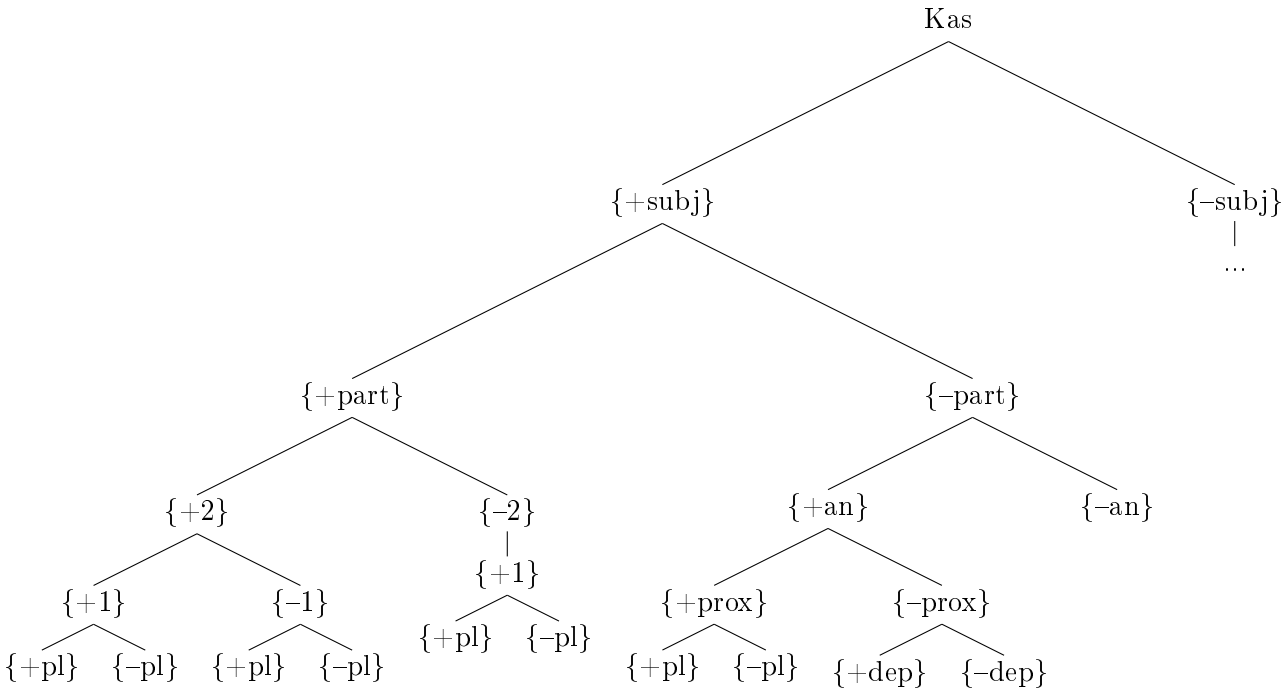
1>2	{ ~~subj~~ –2 +prox +part ±pl } { –subj +2 +prox +part ±pl }	-iti	2.Acc
1>3	{ ~~subj~~ –2 +prox +part ±pl } { ~~subj~~ –2 +prox –part ±pl }	-aa	1/2.Abs
1>3'	{ ~~subj~~ –2 +prox +part ±pl } { ~~subj~~ –2 –prox –part +dep }	-im-aa	Dep-1/2.Abs
12>3	{ ~~subj~~ +2 –prox +part +pl } { ~~subj~~ –2 +prox –part ±pl }	-aa	1/2.Abs
12>3'	{ ~~subj~~ +2 –prox +part +pl } { ~~subj~~ –2 –prox –part +dep }	-im-aa	Dep-1/2.Abs
2>1	{ ~~subj~~ +2 +prox +part ±pl } { –subj –2 +prox +part ±pl }	-i	1.Acc
2>3	{ ~~subj~~ +2 +prox +part ±pl } { ~~subj~~ –2 +prox –part ±pl }	-aa	1/2.Abs
2>3'	{ ~~subj~~ +2 +prox +part ±pl } { ~~subj~~ –2 –prox –part +dep }	-im-aa	Dep-1/2.Abs
3>1	{ +subj –2 +prox –part ±pl } { –subj –2 +prox +part ±pl }	-iko	3.Erg
3>12	{ +subj –2 +prox –part ±pl } { –subj +2 –prox +part +pl }	-iko	3.Erg
3>2	{ +subj –2 +prox –part ±pl } { –subj +2 +prox +part ±pl }	-iko	3.Erg
3>3'	{ ~~subj~~ –2 +prox –part ±pl } { ~~subj~~ –2 –prox –part }	-ee	3.Abs
3>3"	{ ~~subj~~ –2 +prox –part ±pl } { ~~subj~~ –2 –prox +dep –part }	-im-ee	Dep-3.Abs
3'>1SG	{ +obl +subj –2 –prox –part } { –subj –2 +prox +part –pl }	-iko-iji	3.Erg-3.Obl
3'>1PL	{ +subj –2 –prox –part } { –subj –2 +prox +part +pl }	-iko-Ø	3.Erg
3'>12	{ +subj –2 –prox –part } { –subj +2 -prox +part +pl }	-iko-Ø	3.Erg
3'>2SG	{ +obl +subj -2 -prox -part } { -subj +2 +prox +part -pl }	-iko-iji	3.Erg-3.Obl
3'>2PL	{ +subj –2 –prox –part } { –subj +2 +prox +part +pl }	-iko-Ø	3.Erg
3'>3	{ +subj –2 –prox –part } { ~~subj~~ –2 +prox –part ±pl }	-iko-Ø	3.Erg
3'>3"	{ +obl ~~subj~~ –2 –prox –part } { ~~subj~~ –2 –prox ~~dep~~ –part }	-ee-iji	3.Abs-3.Obl

3”>3’	{ +obl +subj –2 –prox –dep –part } { –obl –subj –2 –prox –part }	-iko-iji	3.Erg-3.Obl

One important theoretical question with major empirical predictions is whether features are unordered bundles with each feature having the same ‘weight’, or whether they possess a more complex internal structure. If features *are* organized hierarchically, then differently ordered features will have more or less significance for the grammar of the respective language.

The proposed feature geometry can be represented schematically as follows:

Fig. 9.1. The feature hierarchy



If we assume that the features are indeed arranged hierarchically in this manner, the following may be stipulated:

- features valued with ‘+’ are more specific than those valued with ‘–’;
- features ordered closer to the root of the tree are more specific than those closer to the bottom.

One can come up with a fairly simple mathematical mechanism to derive a particular feature bundle’s specificity. If we say that each positively valued feature has the default specificity value of 2 and each negatively valued feature that of 1, we could further multiply these values by the number 2 raised to the power of the respective feature’s position in the hierarchy: 2^{n}.

$$\sum_{i=1}^{n} f_i * 10^{F_i} \tag{9.1}$$

These specificity principles will resolve naturally the competition between different insertion rules in the sections to follow.

In Block B, the rule that was extrinsically put at the top can also end up being the most specific rule if we take into consideration the feature hierarchy outlined above. The specificity of each vocabulary item may be calculated as follows:

i. { +subj −part } ↔ /-iko/ :: $2 * 10^4 + 1 * 10^3 = 21,000$

ii. { −subj +part −2 } ↔ /-i/ :: $1 * 10^4 + 2 * 10^3 + 1 * 10^2 = 12,000$

iii. { −subj +2 } ↔ /-iti/ :: $1 * 10^4 + 2 * 10^2 = 10,200$

iv. { +part } ↔ /-aa/ :: $2 * 10^3 = 2,000$

v. { −part } ↔ /-ee/ :: $1 * 10^3 = 1,000$

This exponential approach to determining rule specificity provides a mechanism for strict feature dominance.

10 Case Alignment Rules: an Alternative

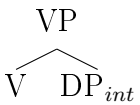
The central question of this work is the formal implementation of the differential case marking system outlined above. The structural assumption I make in this work is that the derivation of the phrasal tree in Plains Cree unfolds in the bottom-up direction in accordance with the *Strict Cycle Condition*. The three operations are *Merge*, *Agree* and *Move* (can be seen as a cross between the two).

The system observed in Plains Cree has an intrinsic hierarchy of features where SAP arguments are ranked higher than 3rd-person arguments. Based on this hierarchy, the syntax of the language can make certain predictions about the parameters of certain elements in the tree before they are even merged in (Georgi 2010). This pre-specification on the head is a way of formally implementing the abstract hierarchy present in the speakers' minds. Thus, the v-head could be pre-specified for some of the features of its arguments:

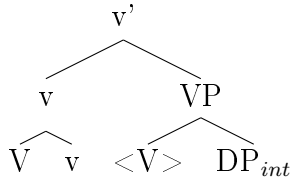
(10.1) [v, •V_{loc}• » •D•, [−subj *−part* *−2* *−1* *−prox* *$u$dep*]$_{int}$
» [+subj *+part* *u2* *u1* *+prox* *−dep*]$_{ext}$] [10]

{ In the representation above, the bullet points stand for sub-categorizing features used by *Merge*, while the stars indicate *Agree's* probes. }

The first element to be merged into the verbal phrase is the internal argument, canonically the direct object. This produces the VP:



After this, the v-head is added to the structure via Merge:



[10] the prefix *u* stands for *unvalued*

The v-head has certain expectations: it expects the internal argument to be a third-person non-proximate actant, i.e. 3' at the highest. Once the v-head enters into an Agree relation with the internal DP, it checks the unchecked features and matches the pre-valued features with those on the DP. **In case of a mismatch, the value on the v-head is overridden, but the respective feature receives a diacritic indicating a violation.** An example of this can be seen below.

(10.2) [... [v, ~~•V•~~ » •D•,
[–subj +part! +2! –1 +prox! –dep]$_{int}$
» [+subj *+part* *u2* *u1* *+prox* *–dep*]$_{ext}$]
... DP$_{int}$ [+part +2 –1 +prox –dep] ...]

Different argument configurations in various transitive predications will include different numbers of such violations.

Table 10.1 Violation Chart

Configuration	Violations	Total	Suffix
SAP>SAP	[+part! +prox!]$_{int}$	2	-iti/-i
SAP>3	[+prox!]$_{int}$	1	-aa
SAP>3'	*none*	0	-aa
3>SAP	[+part! (+2!) (+1!)[11] +prox!]$_{int}$ [–part!]$_{ext}$	4/5	-iko
3'>SAP	[+part! (+2!) (+1!) +prox!]$_{int}$ [–part! –prox!]$_{ext}$	5/6	-iko
3>3'	[–part!]$_{ext}$	1	-ee
3>3"	[–part!]$_{ext}$	1	-ee
3'>3	[+prox!]$_{int}$ [–part! –prox!]$_{ext}$	3	-iko
3'>3"	[–part! –prox!]$_{ext}$	2	-ee
3">3'	[–part! –prox! +dep!]$_{ext}$	3	-iko

All configurations with the ergative marker /-iko/ have three or more violations. Those with the accusative markers on local arguments have exactly two violations. The default/absolutive-marked configurations have less than 3 violations.

While merging in the two arguments, the v-head of a transitive predication collects and stores the violations. We can represent them as little stars. When the morphological apparatus receives access to the terminal nodes of the syntactic tree, its impoverishment rules are sensitive to the number of violations present in the current derivation.

I assume the existence of two auxiliary computational functions: ψ(*) returns the total number of violations as an integer. The function μ(a,b) compares two integers and returns the value "+" if a is greater than b, and "–" otherwise. The impoverishment rules then apply as follows:

I. +subj → Ø / μ(ψ(*),2):–

II. –subj → Ø / μ(ψ(*),1):–

The vocabulary insertion rules:

i. { +subj –part } ↔ /-iko/

ii. { –subj +2 } ↔ /-iti/

iii. { –subj -2 +1 } ↔ /-i/

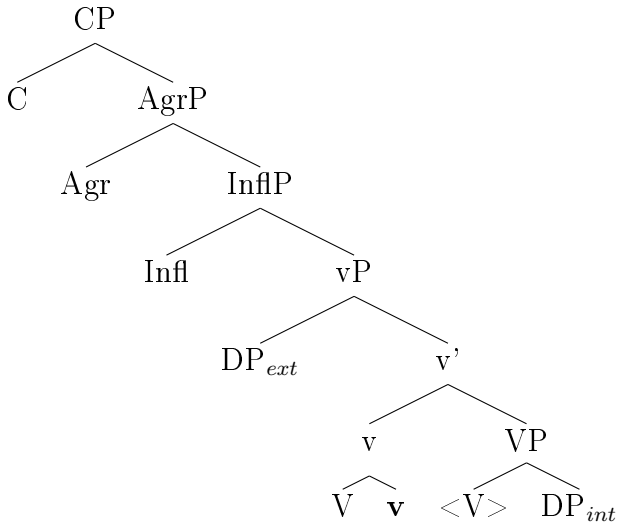
[11] at least one of two!

iv. { +part } ↔ /-aa/

v. { –part } ↔ /-ee/

In this approach, there is no separate **Kas** projection used to mark case. Case marking happens locally within the v-head. The syntactic tree can thus be re-modeled as follows:

Figure 10.1. The revised syntactic structure



The remaining two theme markers, /-im/ and /-iji/, can be integrated into the system by postulating the rules for their insertion presented in the previous section. Both of these affixes can readily be inserted into the v-position.

The following two heads – Agr and Infl – are lowered and adjoined to the v-head in the exact same manner as the procedure described above. There is a certain degree of redundancy in having to postulate a separate Agr head in addition to the v-head which is already fully specified for the features of both arguments. However, the fact that Agr seems to fuse together with Infl (Temp) in order to alternately insert peripheral TAM and agreement affixes (see Section 7) speaks in its favor.

11 Extending the System to Further Verb Classes

The system described in Sections 8 and 9 (for now, we will leave Section 10 alone for simplicity) can be extended beyond the domain of transitive animate verbs (VAT). For the three remaining verb classes, the Slots 1, 2 and 3 display a significantly reduced variety of markers appearing in them. Thus, **intransitive** verbs (animate and inanimate) behave uniformly and only display the morpheme /-iji/ in Slot 3 marking a 3rd-person obviative argument:

Table 11.1. Direction markers in intransitives

Stem	Slot 1	Slot 2	Slot 3
V	-Ø	-Ø	-Ø *or* -iji ↔ 3'

In these configurations, one could assume the previously mentioned oblique marking. Because different classes of verbs have different lexical stems (often based on the same

root in case of semantic equivalence), one could expect these lexical stems being specified for class properties, e.g. [±tr] for transitive and intransitive verbs. Furthermore, both transitive and intransitive verbs would sub-categorize DP's of a particular type (the only argument or, alternatively, the object). For instance, the lexical item **waapam** would have the following syntactic specification:

(11.1) WAAPAM [V, +tr, •D•, *+anim*, Type:ANIM]

The respective features – **+tr** **Type:*ANIM*** – on the v-head must be checked for full interpretation. Otherwise, the structure is ill-formed.

For intransitive verbs, an additional **enrichment** rule will be introduced:

(11.2) Ø → +obl / [–tr { ___ –prox }]

The functional head **Kas** which combines with *–tr* verbs will also lack insertion rules from the first two blocks.

Transitive inanimate verbs (VIT) display two affixes in Slot 2 – /-am/ and /-ee/. The former appears with 3rd-person subjects, the latter with SAP subjects. Additionally, the marker /-iji/ appears with a 3rd-person obviative subject.

Table 11.2. Direction markers in VIT

Pt/Ag	2	1	3	3'
0	-ee	-ee	-am	-am-iji

The marker /-am/ could be assumed to merely indicate the presence of an inanimate argument in the respective predication. [12] The rule Block B presented in the previous section would in this case be extended as follows:

i. { +subj –part } ↔ /-iko/ (3.ERG)
ii. { –subj –2 +part } ↔ /-i/ (1.ACC)
iii. { –subj +2 } ↔ /-iti/ (2.ACC)
iv. { –anim } ↔ /-am/ (0.ABS / 3INAN.ABS)
v. { +part } ↔ /-aa/ (SAP.ABS)
vi. { –part } ↔ /-ee/ (3.ABS)

Two things need to be taken into immediate consideration under this assumption. Firstly, one needs to explain why this affix doesn't appear in SAP>3INAN configurations. The reason for it is the fact that the feature ±anim is less specific than ±part, so rules (v) and (vi) will always takes precedence over rule (iv).

Secondly, the insertion of /-aa/ in the same context (determined by the VI insertion rules as defined above) would speak against the actual paradigm where /-ee/ is inserted instead. One tentative solution is getting rid of the distinction between these two absolutive markers. Instead, one could just say that only the VI specified as /-ee/ exists in the lexicon, re-writing the insertion rules as follows:

i. { +subj –part } ↔ /-iko/ (3.ERG)
ii. { –subj –2 +part } ↔ /-i/ (1.ACC)

[12] Alternatively, one could say that this affix actually marks the accusative case of inanimate objects. This would be a very unexpected thing to do within the system outlined in the previous chapters. It could be treated as an exception. It might also be a remnant from a previous stage of the language's evolution.

iii. { –subj +2 } ↔ /-iti/ (2.ACC)

iv. { –anim } ↔ /-am/ (0.ABS / 3INAN.ABS)

v. { ... } ↔ /-ee/ (DEF(ault))

A **readjustment** rule could then add the [+lo] feature to this morph in the SAP>3(') contexts in transitive animate predications:

$$\text{–lo} \rightarrow \text{+lo} \;/\; [\;\underline{\quad}\; \{\ \text{+subj –part}\ \}\ \{\ \text{+part +anim}\ \}\ ]$$

Here, I have assumed that the readjustment rule has access to all the features of the predicate's arguments, even after those have been checked and cannot be used for insertions any more. There is, thus, a certain asymmetry in feature visibility at the interface between morphology and phonology.

12 From DM to OT

The *Optimality Theory (OT)*, as described in Prince and Smolensky 2004, has been one of the most prominent models in theoretical phonology in the recent years. Besides, it has been gaining prominence in models analyzing other modules of grammar including both syntax and morphology.

In this work, I will follow the standard principles of OT, including the following crucial concepts:

1. the Grammar of any natural languages possesses a set of constraints (most of them being universal and shared by all languages).
2. these constraints are per definition *violable*. This means, a single violation of a constraint doesn't make an utterance ungrammatical. In fact, many if not most grammatically correct utterances in any natural language have violated constraints.
3. there are two types of constraints – *markedness constraints* and *faithfulness constraints*. The former tell the speaker to avoid certain output configuration as undesirable for a bunch of different reasons. The latter are supposed to make sure that the output of any given grammatical module is as close to the input as possible.
4. all constraints within a module of grammar are ranked in a hierarchical manner. That means, violations of certain constraints have more serious implications than others.
5. after receiving some material in the input, every module of grammar runs the so-called *Generator of Candidates* where various features of the input are manipulated in order to yield various output candidates. The exact description of how the Generator works is a major discussion topic in linguistics. In this paper, I am assuming that the Generator manipulates the features of the respective functional heads in a way to make it possible for all the VI insertable into this head to compete against each other, as well as the maximally impoverished null-marker.
6. the candidates 'spewed out' by the Generator are then evaluated by a straightforward evaluation mechanism. It starts with the most highly ranked constraint and maps it onto all the candidates. Those candidates that pass the test move on, regardless of how many constraints they may violate in total further down the hierarchy. This is called *Strict Domination*. The algorithm continues downwards

along the hierarchy of constraints until one ***optimal*** candidate remains. Scenarios where, after checking all the constraints, there are still competing candidates, are generally not desirable.

7. Certain constraints may not be ranked as higher or lower respective to one another. In this case, one draws a dashed line in the evaluation *Tableau*. This is the case where the contexts in which the constraints are violated are disjoint. This is the *Constraint A or Constraint B* scenario.
8. Alongside the *OR* scenario, a logical conjunction of constraints is imaginable, as well. For instance, one can take constraints A and B and form a further complex constraint: C = A & B. C is violated iff A and B are violated simultaneously. This is termed *Local Conjunction* and will be used extensively in this current analysis.

The harmonic scales of constraints introduced above can be re-designed in order to make them 'Cree-specific'. In Cree, the important interaction is the one between the Subject/Object dimension and that of the ontological salience hierarchy. The scales of desired/undesired scenarios may be defined as follows:

H1: *Subj/Inan » *Subj/3' » *Subj/3 » *Subj/SAP

H2: *Obj/SAP » *Obj/3 » *Obj/3' » *Obj/Inan

Now, each of these constraints can be locally conjoined with the faithfulness constraint $*Ø_c$ suggesting that no case should remain unmarked. The local conjunction will produce the following result:

H1: *Subj/Inan & $*Ø_c$ » *Subj/3' & $*Ø_c$ » *Subj/3 & $*Ø_c$ » *Subj/SAP & $*Ø_c$

H2: *Obj/SAP & $*Ø_c$ » *Obj/3 & $*Ø_c$ » *Obj/3' & $*Ø_c$ » *Obj/Inan & $*Ø_c$

Logically, it more important for Plains Cree to hang a subject-marked inanimate subject than an SAP one. The reverse idea applies to the objects.

In order to make this approach work, we need to assume a slightly different breakup of case features. Instead of having just one binary feature – { ±subj } – two features will be introduced: { ±subj ±obj }. The motivation for is the following consideration: in order to capture the impoverishment taking place at the interface between syntax and morphological insertion, we need to deem some feature configurations marked, effectively ruling them out. This can be made possible by placing this markedness constraint above the faithfulness constraint DEP which prohibits manipulating the values of various features. This can, however, only be done for the { ±subj } feature, while the objects cannot ever be manipulated. If we only assume the above-mentioned feature { ±subj }, the constraint would have to formulated in a rather sloppy way where only { +subj } can be reduced to zero, but nothing can be done with { –subj }. Instead of postulating such particular constraints, I have decided to assume one more binary feature, namely { ±obj }.

The cases will then be represented as follows:

* Erg: { +subj –obj }
* Acc: { –subj +obj }
* Abs/Def: { }

The constraints:

C1 $\text{DEP}_{\text{f-\{subj\}}}$ (do not change feature values, except for *subj*)

C2 *$\emptyset_c$ (avoid unmarked case)

C3 *[{ +subj –part +prox } { +obj –part –prox }]

C4 *[{ +subj –part –prox } { +obj –part +dep }]

C5 $\textsc{Dep}_{\text{subj}}$ (do not change the *subj* feature: ranked lower than C3 and C4, enabling the impoverishment process described in the DM approach)

C6 *[{ +subj –part }] & *$\emptyset_c$

C7 *[{ +obj +part –2 }] & *$\emptyset_c$

C8 *[{ +obj +part +2 }] & *$\emptyset_c$

C9 *[{ +part }] & *$\emptyset_c$

The constraints are ranked in order of their appearance on the list. There is no strict ranking (evidently) between C7 and C8. The evaluation tableaux for the various possible argument configuration are presented below.

1>2		C1	C2	C3	C4	C5	C6	C7	C8	C9
a.	{ +subj –part (–2) } /-iko/	!**							*	*
b.	{ +obj +part –2 } /-i/	!*								
c. ☞	{ +obj +2 } /-iti/									
d.	{ +part } /-aa/								!*	
e.	{ (+obj) –part (–2) } /-ee/	!**								*
f.	Ø insertion, features intact		!*					*	*	*

In line 'a', two feature loyalty violations take place. The subject's feature {+part} crucially changes to {–part}, which entails the change of {+2} to {–2} automatically. In line 'b', the feature {+2} is changed to {–2}. In line 'e', the object undergoes the same transformation in order to insert /-ee/.

SAP>3		C1	C2	C3	C4	C5	C6	C7	C8	C9
a.	{ +subj –part (–2) } /-iko/					!*				*
b.	{ +obj +part –2 } /-i/	!*(*)				(*)				
c.	{ +obj +2 } /-iti/	!*(*)				(*)				
d. ☞	{ +part } /-aa/									
e.	{ (+obj) –part (–2) } /-ee/									!*
f.	Ø insertion, features intact		!*							*

In line 'b', the exact number of violations under C1 depends on which SAP participant is currently at play. The violation under C5 does or does not happen depending on which argument's features are changed in order to achieve the configuration on the left. It it's the SAP argument, then, inevitably, *+subj* becomes *–subj*. In this case, one would also end up with a configuration with two objects. This could easily be ruled out even higher up in the hierarchy, by introducing a highly ranked constraint banning two arguments with identical case features.

3>SAP	C1	C2	C3	C4	C5	C6	C7	C8	C9
a. ☞ { +subj –part (–2) } /-iko/							*		*
b.1. { +obj +part –2 } /-i/						!*			
b.2. { +obj +2 } /-iti/						!*			
c. { +part } /-aa/						!*	*		
d. { –part } /-ee/						!*	*		*
e. Ø insertion, features intact						!*	*		*

In lines 'a', 'c', 'd' and 'e', either C7 or C8 will be violated depending on the exact nature of the SAP argument.

3>3'	C1	C2	C3	C4	C5	C6	C7	C8	C9
a. { +subj –part } /-iko/			!*						
b. { +obj +part –2 } /-i/	!*					*			
c. { +obj +2 } /-iti/	!*					*			
d. { (+obj) +part } /-aa/	!*					*	*		
e. ☞ { ~~+obj~~ –part } /-ee/					*				
f. Ø insertion, features intact		!*				*			

3>3"	C1	C2	C3	C4	C5	C6	C7	C8	C9
a. { +subj –part } /-iko/				!*					
b. { +obj +part –2 } /-i/	!*					*			
c. { +obj +2 } /-iti/	!**					*			
d. { (+obj) +part } /-aa/	!*					*	*		
e. ☞ { ~~+obj~~ –part } /-ee/					*				
f. Ø insertion, features intact		!*				*			

3'>3	C1	C2	C3	C4	C5	C6	C7	C8	C9
a. ☞ { +subj –part } /-iko/									
b. { +obj +part –2 } /-i/	!*					*			
c. { +obj (+part) +2 } /-iti/	!**					*			
d. { (+obj) +part } /-aa/	!*					*	*		
e. { ~~+obj~~ –part } /-ee/					!*				
f. Ø insertion, features intact		!*				*			

13 On the Conjunct Order

The *Conjunct Order* is used in several different contexts in Plains Cree, primarily in subordinate clauses.

The agreement pattern in the Conjunct Order poses a significant challenge for anyone who is working on Cree morpho-syntax. There are many major differences in the inflectional paradigm, some of which will be outlined below:

a. the prefix position is not used at all for personal agreement;

b. the case markers are present in the case slots, but they are distributed in a different manner, failing to surface entirely in some of the paradigm cells (see table below);

c. the suffix slots which are used in the independent order solely for φ-agreement purposes are now hosts for portmanteau morphemes encoding the exact configuration of the arguments, thus making case marking in the direction slot redundant in many cases (hence the poor occurrence statistics for case markers in the conjunct forms).

In order to illustrate these differences, the independent case markers have been juxtaposed with those in the conjunct mood in the table below:

Table 13.1. Direction/case markers: the big picture

Order ➤	**Independent**		**Conjunct**	
'Theme' ➤	DIR	INV	DIR	INV
1:2	-i	-iti	-i	-it
1SG:3	-aa	-iko	-Ø	-Ø
1PL:3	-aa	-iko	-aa	-iko
2SG:3	-aa	-iko	-Ø	-Ø
2PL:3	-aa	-iko	-aa	-iko
3:3	-ee	-iko	-aa	-iko
SAP:0	-ee	N/A	-am	N/A
3:0	-am	N/A	-Ø	N/A

One thing that is less than straightforward is the distribution of the absolutive/default case markers /-aa/ and /-ee/. In Section 10, I spoke about merging these two into one and introducing a phonological readjustment feature manipulating the height feature [±lo]. The table above makes it even more complicated than that.

Firstly, the absolutive marker cannot be featurally void since we need a zero marker for the four cells in the conjunct order where case features are not expressed at all. Secondly, the distribution of /-aa/ and /-ee/ makes the assumptions made in Section 10 implausible. If these two markers are indeed one morpheme underlyingly, the phonological specification for it should be /-aa/, not /-ee/. The two contexts where /-ee/ appears are fairly arbitrary and do not form a natural class in terms of their featural bundles. This indicates that two different readjustment rules of the type *[+lo]* → *[–lo]* may be needed.

Furthermore, the morpheme /-am/ marking an inanimate argument appears in the diagonally opposite cells in the two different orders.

The vocabulary item insertion rules need to be revised again:

i. { +subj –part } ↔ /-iko/ (3.ERG)

ii. { –subj –2 +part } ↔ /-i/ (1.ACC)

iii. { –subj +2 } ↔ /-iti/ (2.ACC)

iv. { –anim } ↔ /-am/ (0.ABS)

v. { αpart } ↔ /-aa/ (ABS) vi. { ... } ↔ Ø *the 'elsewhere' case*

Basically, the VI inserted by Rule (v) now indicates merely the presence of 'an argument.' Functionally, it is just as good as the null morpheme.

14 Conclusions

The main purpose of this work is investigating the grammatical phenomenon usually referred to as **Inverse Morphology** as it is observed in the Algonquian language Plains Cree. The Alqonquian languages are one of the major language families spoken in North America. They are well documented and have been subject to numerous linguistic analyses. Like many other indigenous languages of the Americas, the Algonquian languages have rich verbal morphology where a finite verb normally surfaces with multiple inflectional affixes reflecting various grammatical categories, such as tense, mood and personal agreement.

Just like many (or even most) other languages with complex verbal morphology cross-linguistically (e.g. Georgian, Hoocąk, Mapudungun, Nahuatl, Swahili etc.), the Algonquian languages have *polypersonal agreement*: a bivalent verb agrees with both of its core arguments. Peculiar for this particular group of languages is the fact that most of the agreement affixes only reflect the respective arguments' φ-features (at least in the Independent Order), without saying anything about their status in the proposition (e.g. Agent vs. Patient). Combined with the relatively poor nominal morphology (no structural case) and free word order patterns, this creates a challenge that needs to be resolved by these languages' Linking mechanism.

This problem is solved by using what is traditionally called *theme*, or *direction*, markers. Inserted into a designated slot within the verb's morphological template, these affixes tell the listener whether the argument configuration in a predication is properly aligned with a salience hierarchy encoded in the respective language's grammar. If the agent of a transitive predication happens to be less salient (i.e. less discourse-central) than the patient, a special *inverse* marker indicates this mismatch.

For this thesis, I have selected a particular Algonquian language, namely Plains Cree, in order to investigate the above-mentioned phenomenon more closely and answer some relevant questions:

a. How is the *inverse pattern* implemented formally in the grammar? Is there a morpho-syntactic feature called INV in Plains Cree? If yes, how is it parsed/interpreted?

b. What is the closest typological correspondence to this inverse pattern? Can inverse and 'non-inverse' systems be traced back to a common origin?

After investigating the conjugation paradigm found in Plains Cree, I claim that, in this particular language's morpho-syntax, there are no typologically 'exotic' features. What actually surfaces in the direction-marking slot in the verbal paradigm is actually a fairly simple inventory of case markers. Each one of these markers refers only to one of the predication's core arguments, i.e. they are not portmanteau suffixes.

The fact that these case markers appear in atypical configurations has nothing to do with the presence of a special inverse feature in the system. This kind of behavior is found

in many different languages including Spanish, Hebrew, Russian and many others. The pattern of *Differential Case Marking* realizes morphological case on arguments which are deemed unexpected/atypical by the system based on an intrinsic salience hierarchy. Thus, one could imagine that a language is more likely to code animate accusatives while leaving inanimate objects unmarked since the default interpretation of an inanimate argument's syntactic role is that of an object. In Plains Cree, 1st- and 2nd-person arguments are considered more salient than 3rd-person actants; therefore, they are expected to serve as subjects (agents) in transitive predications. When this is not the case, they bear overt object markers. The opposite happens with 3rd-person arguments: they are normally expected to be the object. Should they show up in the agentive role, a subject marker is necessary, unless the object (a) is overtly marked as being 'less important' than the subject or (b) is inanimate.

This solution makes Plains Cree less typologically extreme than some might think it is. It does, indeed, pattern very neatly with many other languages that have global case splits. This is just another example of a system where the case split is based on a language-specific salience hierarchy. These effects can indeed be found in many various languages (see Georgi 2010), in both dependent- and head-marking phenomena. The pattern found in Plains Cree might seem odd at the first glance, but there is nothing about it that would really place it aside.

15 References

Adger, David. 2003. *Core Syntax.* Oxford University Press.

Aissen, Judith. 2003. Differential Object Marking: Iconicity vs. Economy. *Natural Language & Linguistic Theory 21.* 435-483.

Dahlstrom, Amy. 1991. *Plains Cree Morphosyntax.* London & New York: Garland Publishing, Inc.

Georgi, Doreen. 2010. Local Modelling of Non-Local Dependencies in Syntax. In: A. Alexiadou, T. Kiss & G. Müller (eds.), *Linguistische Arbeiten 547.* De Gruyter. 305-336.

Halle, Moris & Alec, Marantz. 1993. Distributed Morphology and the Pieces of Inflection. In: Kenneth Hale & Samuel Jay Keyser (eds.), *The view from Building 20: Essays in Linguistics in Honor of Sylvian Bromberger.* Cambridge, Mass.: MIT Press. 112-176.

Halle, Morris & Marantz, Alec. 1994. Some Key Features of Distributed Morphology. In: A. Carnie, H. Harley & T. Bures, eds., *Papers on Phonology and Morphology. Vol. 21 of MIT Working Papers in Linguistics, MITWPL, Cambridge, Mass.* 275-288.

Klaiman, M. H. 1992. Inverse languages. *Lingua 88.* 227-261.

Malchukov, Andrej. 2007. Animacy and asymmetries in differential case marking. *Lingua 118.* 203–221.

Mosel, U. & Hovdhaugen, E. 1992. *Samoan Reference Grammar.* Scandinavian University Press, Oslo.

Müller, Gereon. 2007. Extended Exponence by Enrichment: Argument Encoding in German, Archi, and Timucua. *Working Papers in Linguistics 13.* 253-266.

Nichols, J. 1986. Head-marking and dependent-marking grammar. *Language 62(I).* 56-119.

Noyer, Rolf. 1992. Features, Positions, and Affixes in Autonomous Morphological Structure. PhD thesis, MIT, Cambridge, Mass.

Preminger, Omer. 2014. *Agreement and Its Failures.* Cambridge, Massachusetts & London, England: The MIT Press.

Prince, Alan & Smolensky, Paul. 2004. *Optimality Theory. Constraint Interaction in Generative Grammar.* Blackwell Publishing.

Seiichi, Makino & Michio, Tsutsui. 1994. *A dictionary of basic Japanese grammar.* The Japan Times.

Stiebels, Barbara. 2002. Typologie des Argumentlinkings. Ökonomie und Expressivität. Akademie Verlag.

Stump, Gregory. 2001. *Inflectional Morphology. A Theory of Paradigm Structure.* Cambride University Press.

Wolfart, H. Christoph. 1973. Plains Cree: a grammatical study. Philadelphia: the American Philosophical Society.

World Atlast of Language Structures: http://wals.info/

Wunderlich, Dieter. 2005. The challenge by inverse morphology. *Lingue e Linguaggio 4.* 195-214.

Zúñiga, Fernando. 2006. Deixis and alignment. Inverse systems in indigenous languages of the Americas. Amsterdam & Philadelphia: John Benjamins Publishing Company.

16 Originality and Authenticity Pledge

I, Yuriy Kushnir, sign this pledge and thereby confirm that I have written this BA thesis myself without using third-party persons' assistance.

I have overtly mentioned all the literary resources I have used for writing this thesis.

Leipzig, June 11, 2015 Y. Kushnir