

The Geometry of Local Case Affixes¹

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Abstract

In this paper I discuss the morphology of local cases based on results of a survey of 62 languages. I propose a non-linear structure of the local case affixes, which has two main components: Location and Mode. Unlike some previous works (Koopman 2002, den Dikken 2006), I argue that both components are always present in the structure. Moreover, I suggest that the terminal nodes that are dominated by Location and Mode include Place and Distal and Motion, Orientation and Aspect, respectively. The arguments in favor of the non-linear organization of the local case affixes come from two sources: portmanteau morphemes and implicational universals

1. Research hypothesis

Languages vary with respect to the ways they encode spatial relations: some languages use prepositions, whereas others use local cases. This paper will explore the structure of the local case affixes, leaving the structure of PPs for future research.

It has been proposed in the literature (Koopman 2000, den Dikken 2006, Svenonius to appear) that PPs have a complex structure. Despite differences in structures proposed by the researchers mentioned above, they all agree that there are two types of PPs –locational and directional—with the latter being built on the basis of the former.

(1) [P_{DIR} [P_{LOC}]]

Unlike the Indo-European languages, many of the world's languages lack prepositions and express spatial relations with the help of local cases, many of which have a complex morphological structure. If the structure in (1) is correct, the null hypothesis is that the morphological expressions of local cases are expected to have the same basic structure:

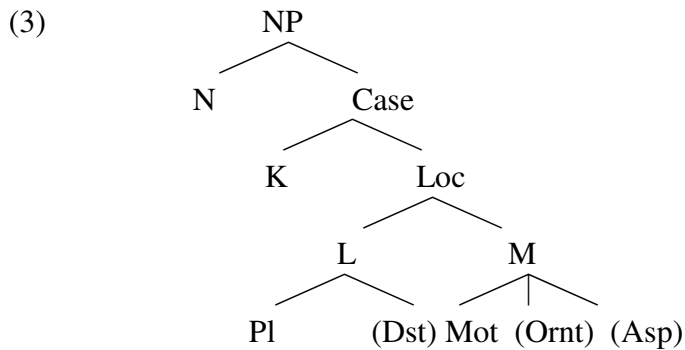
(2) [[[N] Loc] Dir]

Researchers have proposed that PPs have a complex structure (Koopman 2000, den Dikken 2006, Svenonius to appear) which goes beyond a simple locative/ directional

¹ I would like to thank Jonathan Bobaljik for valuable discussion and help.

division (as in Kracht 2001). One might expect to find morphological reflexes of this complex structure.

To test my hypotheses, I looked at grammars of 62 non-Indo-European languages that belong to 5 different language families as well as several language isolates². The data from these 62 languages uniformly show that there are indeed two components in the structure of the local cases –locational and directional. Moreover, the local case morphology of the languages surveyed provides evidence for more complex structural organization of the local case affixes. I suggest the following geometrical organization of the local case affixes:



Significantly, all the languages surveyed, without exception, conform to the template in (3)³. In the next sections of the paper I present arguments for the geometry in (3). Although the structure of local cases given in (3) is not the same as proposed for spatial PPs, I will leave for future work the question of whether (3) might be extended to PP structure.

The paper is organized as follows. First, I discuss the linear order of the spatial morphemes found in the languages under discussion; then, I suggest a geometrical organization for these morphemes and propose features characterizing each node. Having established the structure of local case affixes and the inventory of features relevant for each node, I present two arguments supporting the structure in (3).

2. Morphological components of local cases⁴

As has been previously noted by Comrie and Polinsky (1998), Kracht (2002, 2005, etc), Svenonius (to appear), and van Riemsdijk and Huybregts (2001), local cases have a

² A list of languages is given in Appendix 1.

³ The Australian languages surveyed in (Dixon 1976) also seem to conform to the structure in (3).

⁴ A list of definitions of cases is given in Appendix 2.

complex structure. The Daghestanian languages, characterized by a large number of local cases and transparent morphology, provide a good illustration. An example of such a language is Lak, a Nakh-Daghestanian language. This language has 6 series of local cases. Each series is characterized by a specific marker denoting spatial relations which basically correspond to prepositions. Moreover, each series can have 5 cases: essive⁵, allative, ablative, translative, and versative, as shown in (4).

(4) Lak local cases

Series marker	Essive	Allative	Ablative	Translative	Versative
-vu 'in'	Ø	-n	-a(tu)	-x	-maj
-j 'on'	Ø	-n	-a(tu)	-x	-maj
-lu 'under'	Ø	-n	-a(tu)	-x	-maj
-h 'behind'	Ø	-n	-a(tu)	-x	-maj
-ča 'near'	Ø	-n	-a(tu)	-x	-maj
-c' 'next to'	Ø	-n	-a(tu)	-x	-maj

In Lak allative case consists of two parts: location (a series marker /vu/ 'in') and direction (an allative suffix denoting movement to a location). Moreover, Lak has a versative case that denotes the general direction of movement, when the final destination is not reached –the movement is simply proceeding in a particular direction. The versative case in Lak is formed by adding a morpheme /maj/ to the allative case form of the noun, as shown in (5).

(5) N-vu-n-maj 'in the general direction of something'
in-all-versative

Examples like the one in (5), in which one case is built on top of another case by adding another spatial morpheme, are abundant in the languages surveyed.

One of the available approaches to the structure of local case morphemes has been proposed by Kracht in a number of works (2001, 2002). Kracht (2002) suggests that all locational expressions consist of two components: localizers and modalizers which form a unit realized as either a PP or a local case. Kracht analyzes NPs marked for local cases as consisting of three elements: the DP itself (landmark), L (localizer), and M (modalizer): the DP (a hid) denotes an entity in (6), L (-al) takes this entity and returns a spatial region,

⁵ Essive case does not have a special morphological marker, in other words, its form coincides with the form with a series marker.

M (-a) takes that region and returns an adverbial which denotes the fact that the entity that moves changes its location⁶.

- (6) [[DP L] M] (Hungarian)
 a hid al- a
 (to) under the bridge

In Kracht's system, localizers denote a location, whereas modalizers denote modes. He suggests that there are 6 modes that correspond to various local cases in different languages: static (essive case), approximative (approximative case), cofinal (illative case), recessive (allative case), coinital (elative case), and transitive (transitive case). It is important to point out that, unlike previously mentioned researchers, Kracht proposes exactly the same structure for NPs denoting two different types of spatial meanings –locational and directional.

The result of the survey of 62 languages bears out Kracht's view that there are always at least two layers of structure in local case affixes: it is not always the case that essive is Ø-marked as in Lak (see (4)); it is only a trend. There are 12 languages which have essive case non-Ø-marked as, for example, in Akhvakh. This fact presents a challenge to Koopman, den Dikken, Svenonius who suggest that locational PPs have just one layer of structure and lack the motion component.

(7) Akhvakh local cases

- | | | |
|-------------|-----------|-------------|
| a. g+ a | b. g + e | c. g + u |
| on+allative | on+essive | on+ablative |

There are more than two types of spatial affixes (L and M). I propose that there are 5 possible types of affixes available in language. There are two morphemes which denote location: Place morphemes express spatial relations {in, on, at, ect.}; Distal affixes encode proximity. There are three types of M morphemes: Motion affixes denote the presence of motion (ablative and allative cases) or absence of motion (essive case), Orientation affixes have meanings 'towards/away' and 'upward/downward, and, finally, Aspect morphemes specify what kind of movement is involved, i.e. whether the movement reaches its goal or not, whether the movement has some direction or the direction is unspecified. Combining these 5 types of morphemes results in the structure in

⁶ The structure in (6) raises an important issue of what the case endings attach to –DP or N-which is beyond the scope of the paper. Kracht in his works suggests that case endings attach to DP. I assume that they attach to N.

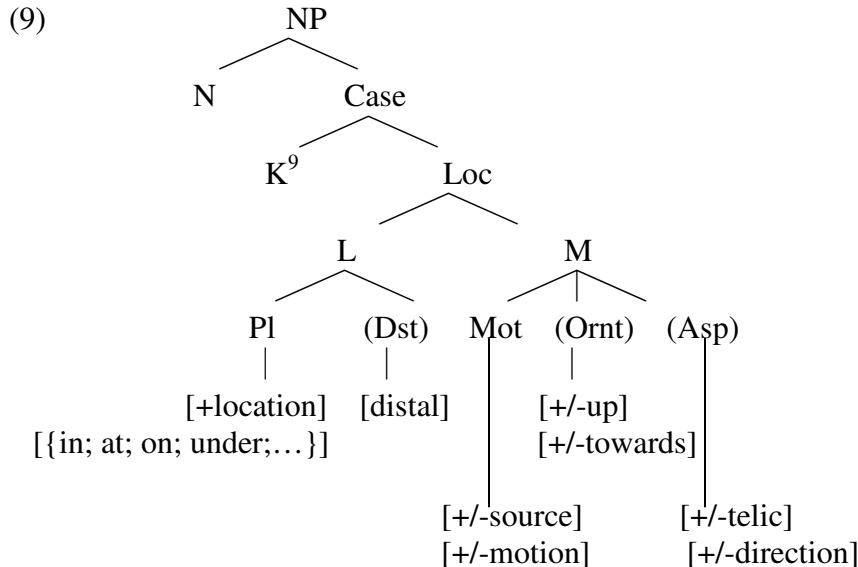
(8) which represents the linear order of the spatial morphemes to which all 62 surveyed languages conform.

(8) N- K⁷- Place- Distal- Motion- Orientation-Aspect⁸

Furthermore, in this paper I argue for the geometrical organization of local case affixes, presented in (3), which is based on (8).

3. Feature specification in the local case hierarchy

This work is done in the framework of DM which postulates that lexical items (suffixes) are listed in the Vocabulary. Each vocabulary item consists of two parts: a phonological exponent and a set of features that determine its insertion in terminal nodes. In this section I will discuss what features characterize terminal nodes in the structure in (9) and provide rules of insertion.



⁷ K stands for cases (ergative, genitive) on the basis of which local cases are formed, e.g. all local cases in Estonian are built on the top of the genitive case.

⁸ In (8) I place Orientation before Aspect, however, there is no evidence for this ordering as these two types of morphemes never co-occur. One could argue that there is no reason for having two separate nodes for Orientation and Aspect. However, I assume two nodes based on differences in meanings between Aspect and Orientation markers.

⁹ Recall that K hosts all non-local cases. I follow Calabrese (2006) who argues that all non-local cases can be captured with four binary features: [+/-peripheral, +/-source, +/-motion, +/-location]. I use the same features for local cases. The issue of interaction between local and non-local cases is discussed in Radkevich (2008). The problem of feature specification of local and non-local cases requires further investigation which is beyond the scope of the paper.

I suggest that the node Place under L is specified for feature [location] as it refers to some location. Besides this feature, Place has node specific features. I suggest that Place has several features such as [in], [on], [behind], [under], etc, which specify the position of the object in space. The second node of L is Dist which is specified for the feature [distal]¹⁰. DM argues for featural underspecification, i.e. using only those features that are crucial to distinguishing between different exponents. In this paper I will give full feature specifications of nodes¹¹.

- (10) Place: [+location, {[in], [on], [under], [behind], [at],...}]
 Distal: [distal]

Consider the following example from Tabasaran which has 8 series markers. The rules of insertion for this language are given in (11).

- (11) /k/ ⇔ [+location, on, vertical]
 /?/ ⇔ [+location, in] **Place**
 /?in/ ⇔ [+location, on]
 /q/ ⇔ [+location, behind]
 /kk/ ⇔ [+location, under]
 /x^y/ ⇔ [+location, at]
 /γ^y/ ⇔ [+location, among]
 /h/ ⇔ [+location, near]

The situation is similar in languages that do not have serial markers, e.g. Finnish, as well as other Balto-Finnic languages, has two series of local cases –interior and exterior. The rules for Finnish would be as follows:

- (12) /s/ ⇔ [+location, in] **Place**
 /l/ ⇔ [+location]

The next node in question is distal that is found only in Tsez. Only distal locations have a special morphological exponent. The distribution of distal/ non-distal markers in Tsez is governed by the following rules.

- (13) /z/ ⇔ [distal] **Distal**

¹⁰ Since no language in the survey marks a [-distal] overtly, I will treat [distal] as a privative feature. The issue of whether features should be uniformly privative, all binary or a mixture is left for future research as nothing in the paper appears to depend on these choices. It is important to point out that not all languages morphologically realize all terminal nodes in (9). In this case I will assume that such nodes are not available in those languages.

¹¹ Adopting the principle of underspecification argued for by DM would give, in principle, the same results, but it would lead to some arbitrary choices of elsewhere variants.

Besides the distal morphemes, Tsez, like other Daghestanian languages, has series markers whose insertion is determined by the following set of rules.

- (14) /q/ ⇔ [+location, on, vertical] **Place**
 /de/ ⇔ [+location, in front]
 /ā/ ⇔ [+location, in]
 /λ/ ⇔ [+location, among]
 /ʁ/ ⇔ [+location, on]
 /ʁ'/ ⇔ [+location, under]
 /x/ ⇔ [+location, at]

Having established the rules for L nodes, I now turn to M nodes –Motion, Orientation, and Aspect. In section 2, I showed that there are three types of elements that can go under Motion –they may denote the absence of movement (essive cases), movement to the goal (allative cases), and movement away from the source (ablative cases). I propose that we need two features to account for the distribution of these morphemes. First, unlike allative and ablative cases, essive cases are devoid of movement, they are static; therefore, I suggest a feature [-motion]¹² to distinguish static cases from the ones that involve movement. Consequently, the other two morphemes are characterized by a feature [+motion]. Now it is necessary to find a way to ensure insertion of a correct lexical item with the feature [+motion]. I suggest using a binary feature [source] whose positive value along with the feature [+motion] correlates with the meaning of ablative cases, whereas a combination of the negative value of [source] and [+motion] yields the meaning of allative cases. The rules of insertion for the node Motion will have the following form:

- (15) Ablative ⇔ [+motion, +source]
 Allative ⇔ [+motion, -source]
 Essive ⇔ [-motion]

An example of implementation of rules in (15) is given below (the example is from Tabasaran).

- (16) /an/ ⇔ [+motion, +source] **Motion**
 /na/ ⇔ [+motion, -source]
 /Ø/ ⇔ [-motion]

¹² As in previous cases, essive can be specified as either having a feature [-motion] or as elsewhere which would not affect the result of vocabulary insertion in cases under discussion.

There are two more M nodes that require discussion. I will first discuss the Orientation node and then move on to the Aspect node. There are only four possible feature combinations that occur under the node Orientation: there are two axes (vertical and horizontal) and the movement can be either towards or away on either of the two axes. I suggest using two binary features: [+/-towards] and [+/- up]. The feature combinations, shown in (17), yield a necessary result ensuring the insertion of a correct lexical item with the Orientation meaning.

(17) Towards	⇔ [+towards]	
Away	⇔ [-towards]	Orientation
Upward	⇔ [+up]	
Downward	⇔ [-up]	

As I mentioned above, there are only two instances of Orientation morphemes that are found in Tabasaran and the Khaidak dialect of Dargwa. In (18) I demonstrate how the rules from (17) work in Khaidak¹³.

(18) /žen/	⇔ [+towards]
/ten/	⇔ [-towards]
/kien/	⇔ [+up]
/hen/	⇔ [-up]

The last node is Aspect. Recall that there are only four case exponents under this node –prolative¹⁴, versative, terminative, and approximative. These four cases can be further divided into two groups –one will consist of prolative and versative, whereas the other one will comprise terminative and approximative.

Prolative and versative case both add new aspects of meaning to [+motion] cases: the first does not indicate the direction of movement, whereas the second one is used to convey a meaning of general direction without any specific point in space in mind. I suggest using a binary feature [+/-direction]: with a positive value for versative case and negative value for prolative case. There is only one language that has both cases –Lak, the rules for which are given in (19)

¹³ There are only two languages which have orientational markers: the Khaidak dialect of Dargwa and Tabasaran. These two languages are genetically related but not very closely. Moreover, they are spoken in non-adjacent regions of Daghestan.

¹⁴ In this paper I do not consider translative case separately but jointly with prolative case. Both prolative and translative cases are characterized by [+motion] under Motion and [-direction] under Aspect, but they differ in feature specification of Place –prolative case requires [+location; +edge (at)], whereas translative case does not.

- (19) /x/ ⇔ [-direction] **Aspect**
 /maj/ ⇔ [+direction]

The last opposition of cases with aspectual meanings is terminative vs. approximative. The main difference in the meanings of these two cases is whether the movement reaches its goal, as it does in the case of the terminative case, or not, as in the case of the approximative. I suggest using a binary feature [telic], with [+telic] for terminative and [-telic] for approximative. Only the Permian languages of the Finno-Ugric language group have both cases in their arsenal. Consider how the rules would work for Udmurt.

- (20) /oz/ ⇔ [+telic] **Aspect**
 /ń/ ⇔ [-telic]

Putting all the features together, we have the following system of rules for different nodes in the structure in (9).

Place: [+location, {in, on, under, etc}]

Distal: [distal]

Motion: [+/-motion]
 [+/-source]

Orientation: [+/-toward, +/-horizontal], [+/-up]

Aspect: [+/-telic]
 [+/-direction]

Consider the following examples which illustrate how the suggested system of features works in Tabasaran (21).

(21) *Tabasaran*

- | | |
|---------------------------------|---------------|
| /k/ ⇔ [+location, on, vertical] | Place |
| /ʔ/ ⇔ [+location, in] | |
| /ʔin/ ⇔ [+location, on] | |
| /q/ ⇔ [+location, behind] | |
| /kk/ ⇔ [+location, under] | |
| /xʸ/ ⇔ [+location, at] | |
| /ɣʸ/ ⇔ [+location, among] | |
| /h/ ⇔ [+location, near] | |
|
 | |
| /na/ ⇔ [+motion, -source] | Motion |
| /an/ ⇔ [+motion, +source] | |
| ∅ ⇔ [-motion] | |

/mina/ ⇔ [+horizontal, +towards]
 /tina/ ⇔ [+horizontal, -towards]
 /ɣina/ ⇔ [+up]
 /k^aina/ ⇔ [-up]

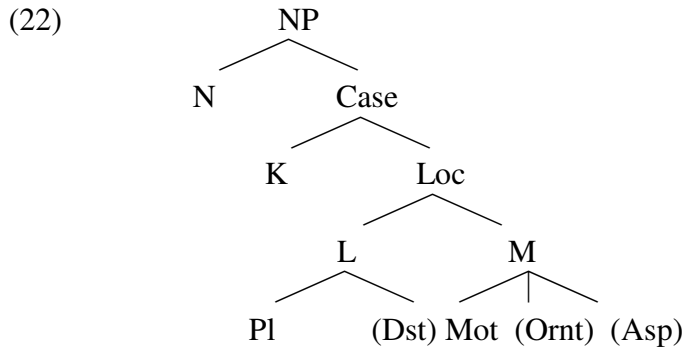
Orientation

/di/ ⇔ [+direction]

Aspect

4. The geometry of local case affixes

Based on morphological data from 62 languages, I have proposed the structure in (3), repeated below as (22), which reflects the linear and hierarchical order of local case morphemes.



I have argued that the five types of morphemes can be divided into two groups: L (localizer) and M (modalizer). Place and Distal would belong to L, whereas Motion, Orientation and Aspect would belong to M.

I also propose that not all nodes dominated by L and M have the same status. Going back to Kracht's structure of spatial expressions, he recognizes two components in the structure: L (localizer) and M (modalizer). In his works, L is basically Place, whereas M is basically Motion. I suggest that Place and Motion are the 'head' nodes under L and M, respectively. What I understand by headedness is that these two nodes (Place and Motion) contribute the core of the meanings of both L and M, whereas Distal, Orientation, and Aspect simply modify Place and Motion, respectively¹⁵. According to the data from the languages surveyed, morphemes lexicalizing Place and Motion are the most widespread. This issue will be addressed in section 4.2.

In the rest of this section I will provide arguments in favor of the complex geometry of the local case affixes presented in (23) that come from two sources: attested and unattested occurrences of portmanteau morphemes and implicational universals.

¹⁵ "Non-head" nodes are given in parenthesis.

4.1. Portmanteau local case morphemes

There are languages in which spatial morphemes get inserted only into terminal nodes (Ax, Pl, Dst, Mot, Ornt, and Asp), i.e. when it is possible to distinguish several smaller morphemes within a larger local case morpheme. On the other hand, there are a few cases of portmanteau morphemes in which it is impossible to single out smaller morphological constituents¹⁶, e.g. in Estonian the terminative case is realized as a morpheme /ni/ which cannot be further divided into components and which represents Pl, Mot, and Asp. In this section I will present evidence for the non-linear organization of the structure of local cases from attested and unattested portmanteau morphemes.

Before going into a discussion of the portmanteau morphemes, I propose a Portmanteau Principle that determines which nodes can be lexicalized.

(23) Portmanteau Principle

The phonological exponent of a vocabulary item is inserted at the minimal node dominating all the features for which the exponent is specified.

The principle in (23) is different from the spanning vocabulary principle suggested in Williams (2003: 214). He argues that a morpheme can lexicalize a chain of functional projections if these projections are adjacent, i.e. if the chain is contiguous, as schematically shown in (24).

$$(24) F_1 > F_2 > F_3 > F_4 > F_5 > F_6$$

|---m₁---|
 |---m₂---|
 |---m₃---|

Williams illustrates the workings of his principle with an example from English, as shown in (25), in which ‘was’ is a lexical element that spans T and Agr_S and ‘seeing’ is a word that spans Asp, Agr_O, and V.

$$(25) T > Agr_S > Asp > Agr_O > V$$

|---was---|
 |-----seeing-----|

If we apply Williams’ suggestion to the structure in (25), we predict that the following types of portmanteau morphemes may exist.

¹⁶ Portmanteau local case morphemes are less common than morphemes which can be decomposed into smaller units.

(26) Pl> Dst> Mot> Ornt> Asp
 |---m1|
 |--m2---|
 |---m3---|
 |---m4-----|
 |-----m6-----|
 |-----m7-----|
 |-----m8-----|
 |-----m9-----| etc

According to Williams, morphemes lexicalizing non-contiguous chains of nodes are not predicted to exist:

- (27) a. *m10 (Pl+Asp),
 b. * m11 (Dst+Asp)
 c. *m12 (Pl+Ornt).

The model presented in (22), together with the Portmanteau principle, makes predictions different from the ones made by Williams' approach. First, it predicts the impossibility of lexicalization of two terminal nodes as a single morpheme when they do not form a constituent, e.g. it disallows portmanteau exponents of Distal+Motion when there is a Place morpheme as well. In other words, I argue for a more restrictive model that does not allow the morphemes in (27), predicted to be disallowed by Williams' theory, as well as morphemes permitted in Williams' theory. He predicts that m2 morpheme lexicalizing Dst and Mot is possible; moreover, his theory also allows a morpheme lexicalizing Pl and Mot in the presence of Asp or Ornt. None of the surveyed languages have these two types of portmanteaus. Mention should also be made of the fact that the Portmanteau principle proposed in (23), similarly to Williams' vocabulary spanning, rules out the lexicalization of non-contiguous (non-adjacent) nodes as portmanteau morphemes, e.g. it excludes the possibility of co-occurrence of a portmanteau morpheme for the nodes Place and Asp in the presence of an exponent of Distal or Motion. In the next part of this section I will discuss cases of attested and unattested portmanteau local case morphemes.

4.1.1. Attested portmanteau morphemes

In this section I will provide evidence for the geometrical organization of local case suffixes, as in (22), based on attested portmanteau morphemes. I group the portmanteau morphemes under consideration in groups based on the nodes that they lexicalize.

4.1.1.1. L(localizer) portmanteau morphemes

There are many languages that lack two nodes dominated by L –Place and Distal. The distal morphemes are particularly rare and are found only in one language –Tsez¹⁷. In the majority of languages there is only one node available –Place. Consequently, there are no cases of portmanteau morphemes.

4.1.1.2. M(modalizer) portmanteau morphemes

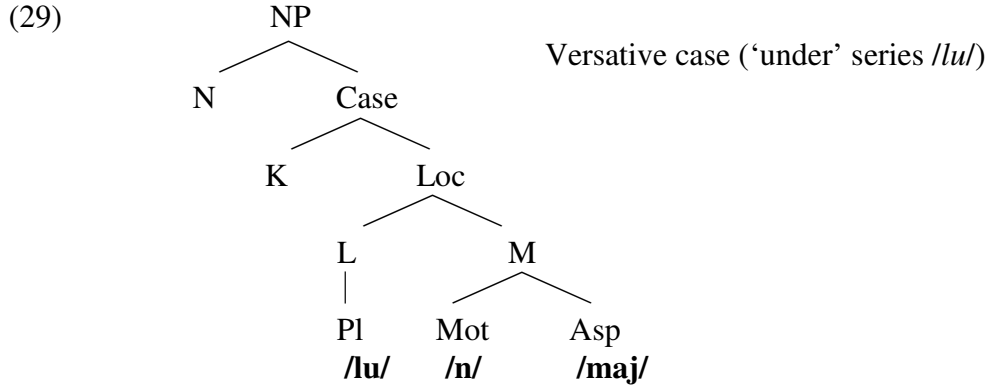
Unlike the cases of L nodes, many languages from the survey have at least two distinct exponents of Motion and Aspect which get lexicalized as two distinct morphemes. Consider the following paradigm from Lak in (28).

(28) <i>Lak</i>	
/vu/ ⇔ [+location, in]	Place
/j/ ⇔ [+location, on]	
/lu/ ⇔ [+location, behind]	
/ča/ ⇔ [+location, near]	
/c/ ⇔ [+location, at]	
/a/ ⇔ [+motion, +source]	Motion
/n/ ⇔ [+motion, -source]	
Ø ⇔ [-motion]	
/x/ ⇔ [+motion, -direction]	
/maj/ ⇔ [+direction]	
	Aspect

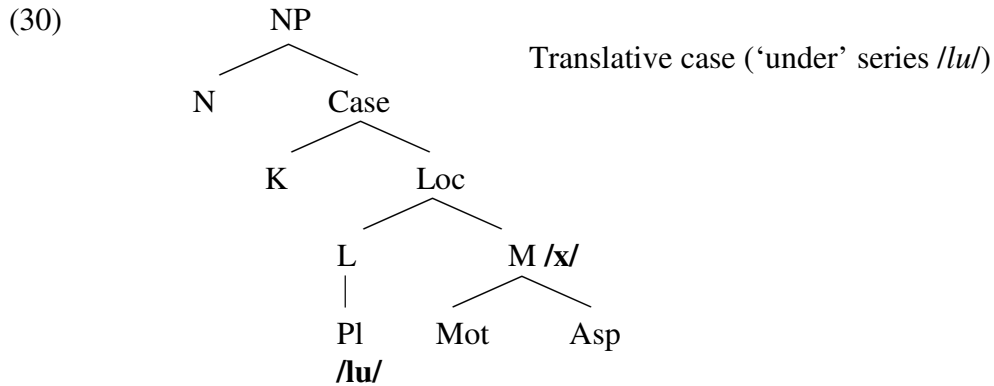
In Lak the versative case exponents are formed by lexicalizing three morphemes – Place (series markers), Motion ([+motion]), and Aspect ([+direction]), as shown in (29)¹⁸.

¹⁷ Claudia Wegener (p.c.) pointed out that there is a distal affix similar to the one in Tsez in Savosavo, a Papuan language spoken on the Solomon Islands.

¹⁸ In (30) I leave out nodes which do not have morphological realization in Lak.



However, the prolative case exponent in Lak consists of only two components, one of which is a relevant series marker (Place/ Axial), e.g. /lu/ (series marker 'under') + /x/. The second constituent conveys the meaning of both M nodes: Motion (there is movement) and Aspect (there is no direction of movement specified), in other words, the morpheme /x/ lexically realizes the features [+motion] and [-direction]. Recall that the portmanteau principle in (23) states that an exponent lexicalizes the minimal node dominating the features that the exponent expresses. In the case of prolative case in Lak, the minimal node that dominates the features [+motion] and [-direction] is M; hence, the portmanteau morphemes lexicalizes the whole node M, as shown schematically in (30).



Another piece of evidence in favor of the structure in (22) comes from Tsez. Recall that Tsez is the only language in the survey which encodes the notion of distality morphologically. Similarly to other languages with local cases, Tsez has seven series of cases with four cases in each series: essive, allative, ablative, and versative. Moreover, this language has an exponent for the node Distal. Interestingly, there are two allomorphs¹⁹ of the versative case exponent, the choice of which depends on the

¹⁹ Both allomorphs are portmanteau morphemes characterized by features [+motion, +direction].

presence/absence of the feature [distal]. The versative case is formed by combining three elements –a series marker, a distality marker (/(\bar{a})z/), and a versative case suffix (/a γ or/), as in (31).

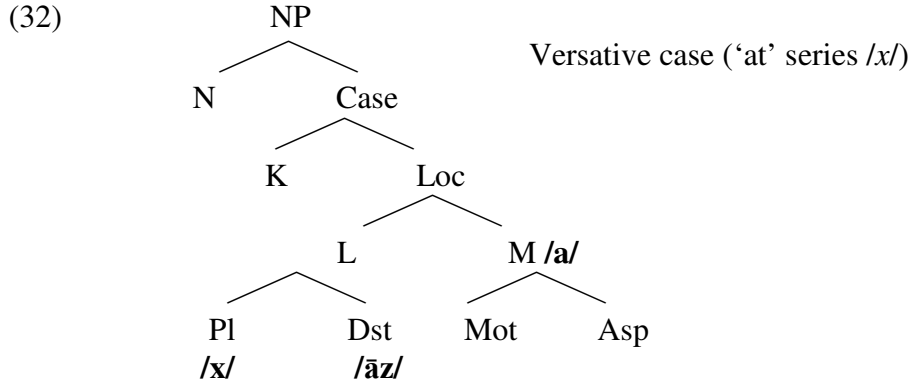
(31) besuro-x- Ø - γ or vs. besuro-x- $\bar{a}z$ - a
 fish- at- Ø -vers fish- at-dist-vers

The portmanteau principle proposed in (23) states that the versative suffix is not a lexicalization of the Aspect node but M, as in the Lak examples in (30). The versative morpheme lexicalizes the features [+motion] and [+direction], which are characteristic of nodes Motion and Aspects, respectively, both of which contribute their meanings to the M node. Hence, the versative suffix is an instance of lexicalization of the M node, as shown in (32).

The choice of the versative suffix depends on the distal marker, i.e. we are dealing with an instance of contextual allomorphy. Bobaljik (2001) distinguishes two types of contextual allomorphy: inwards-sensitive and outwards-sensitive. In the case of outwards-sensitive allomorphy, an affix is sensitive to the morpho-syntactic features of another more peripheral affix. This type of allomorphy is usually triggered by tense and agreement features. The second type of allomorphy (inwards-sensitive) is conditioned by morpho-phonological features such as class marking and other syntactically irrelevant diacritics.

In the case of Tsez, the versative suffix is sensitive to the features of the non-sister node Distal, i.e. it is a case of the inwards-sensitive allomorphy. Chung (2007) captures contextual allomorphy of this type in Korean honorification by appealing to the notion of government (i.e., the allomorphy inducing morpheme is structurally higher than the allomorphy exhibiting morpheme). If we look at the structure in (32a), this approach does not work as the trigger is lower than the affectee. I suggest that the choice of an appropriate versative allomorph can be captured by the rule in (32b), which states that the context for allomorphy is the linear adjacency of the exponent of the feature [distal], which gets inserted earlier than the versative suffix²⁰.

²⁰ However, Chung's account can work for Tsez if we assume that Distal is adjoined to Place and, thus, it c-commands all nodes c-commanded by its sister, i.e. Distal c-commands M (cf. Halle and Marantz 1993: 146)



b. /a/ ⇔ [+direction, +motion]/ [āz] ____

4.1.1.3. Loc portmanteau morphemes

Besides cases of portmanteau morphemes lexicalizing the M node, there are also instances of portmanteaus of the Loc node. Consider the following example from Estonian. Estonian lexicalizes Place and Motion terminal nodes expressing such cases as inessive, illative, elative and adessive, allative, and ablative, as in (33).

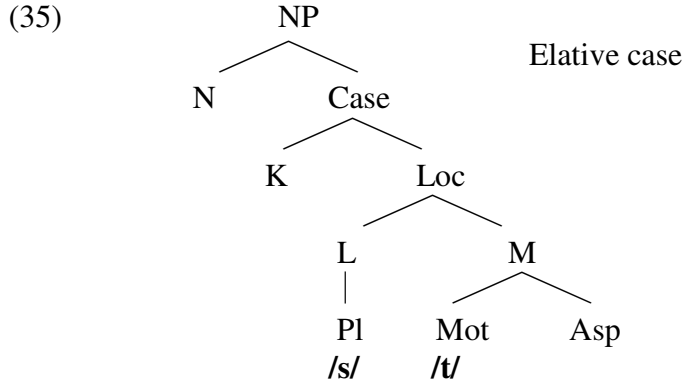
- (33) inessive –s adessive –l terminative -ni
 illative –sse allative –le
 elative –st ablative –lt

The rules of insertion for Estonian are given below.

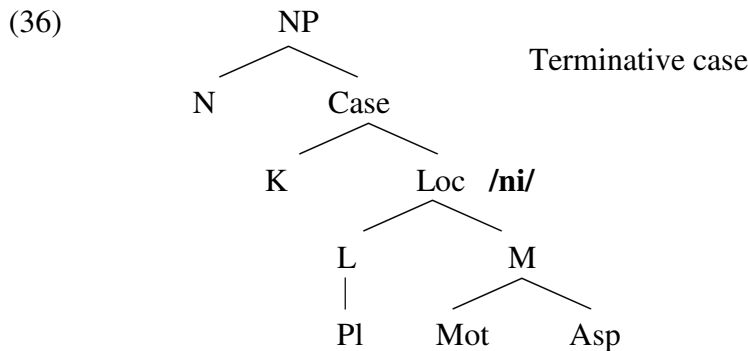
(34) *Estonian*

/ni/ ⇔ [+location, +motion, +telic]	Aspect
/s/ ⇔ [+location, +in]	Place
/l/ ⇔ [+location]	
/t/ ⇔ [+motion, +source]	Motion
/e/ ⇔ [+motion, -source]	
∅ ⇔ [-motion]	

The elative case exponent is /-st/ which consists of two parts –the first one is /s/ which lexicalizes the Place node specified with the feature [+location, +in], whereas the second one is /t/, which realizes the Motion node specified with the feature [+source], as illustrated in (35).



However, the Estonian language has a morpheme which is an exponent of terminative case (*/-ni/*). Unlike the elative case morphemes, the terminative case exponent cannot be further decomposed. It realizes features associated with several nodes: Place (L), Motion ([+motion]) and Aspect ([+telic]). The terminative morpheme */ni/* is another example of a portmanteau morpheme that lexicalizes the node Loc, which dominates the nodes L (Place [+location]) and M (Motion [+motion], Aspect [+telic]) and, which is characterized by three features (Loc= [+location, +motion, +telic]). In other words, the Estonian terminative suffix is a realization of the node Loc, as shown in (36).



In this section, I have discussed attested patterns of portmanteau morphemes which are predicted by the geometrical representation of the structure of local case morphemes and by the portmanteau principle.

4.1.2. Unattested portmanteau morphemes

The survey of 62 languages has shown the absence of the following patterns of portmanteau case exponents:

- a) an exponent lexicalizing Distal and Motion²¹;

²¹ As mentioned earlier, distal suffixes are found only in one language Tsez, however, the fact that I did not find the same morpheme in other language related to Tsez may be due to incompleteness of descriptive grammars. For example, Distal is not given even for Tsez in the sketch in Vinogradov (1967), but only in

- b) an exponent lexicalizing Distal and Aspect;
- c) an exponent lexicalizing Place and Aspect;
- d) an exponent lexicalizing Place and Motion/Aspect/Orientation in the presence of Distal;
- e) an exponent lexicalizing Place and Orientation/Aspect in the presence of Distal/Motion.

The fact that these patterns in portmanteau morphemes are not found in any language surveyed indicates that the structure in (22) correctly blocks unattested portmanteau morphemes that are impossible under the portmanteau principle in (23)²².

4.2. Implicational universals

The second argument for the geometry in (22) comes from implicational universals. As I mentioned earlier, not all the nodes in the structure in (22) have equal status. L and M dominate nodes the status of which is different: Place is the head node under L, whereas Motion is the head node under M. Not all the nodes are available in languages; most languages have at least two nodes Place (L) and Motion (M) which are the head nodes.

From the evidence examined here, I conclude that there is an implicational universal which states that if a language has exponents of one of the non-head nodes²³, then it has the corresponding head node. Thus, the presence of the node Distal (under L) implies the existence of the head node Place. Then, lexical realization of Orientation and Aspect nodes implies realization of the head node Motion. None of the languages surveyed has data contradicting these implicational universals –there are no languages which have an exponent for the node Distal without the Place node exponent or which have the Aspect node exponent without the Motion node exponent²⁴. Mention should be

the article on Tabasaran and Tsez by Comrie and Polinsky (1998). I have not consulted more extensive descriptions for other Tsezic languages.

²² Recall that “non-head” nodes are given in parentheses.

²³ The implicational universals discussed in the paper are relevant only for the terminal nodes, whereas the presence/absence of one of the intermediate nodes (L or M) does not imply the presence/absence of the other node: both nodes are always present in the languages surveyed.

²⁴ 52% of the surveyed languages lexicalize Pl, Mot, and Asp. However, none of them have examples of portmanteau morphemes realizing Pl and Asp node.

made of the fact that if a language lexicalizes Place, this does not imply that it lexicalizes Distal; likewise, if it lexicalizes Motion, this does not imply that it lexicalizes Aspect or Orientation. By proposing the structure in (22), I can unify three implicational universals discussed above: the presence of non-head nodes entails the presence of head-nodes.

On the other hand, lexical realization of any node dominated by L does not necessitate realization of some node dominated by M, i.e., the fact that a language realizes Place does not mean that this language is characterized by having Aspect morphemes. In other words, lexicalization of terminal non-head nodes implies lexical realization of head morphemes. This relation holds only between head and non-head nodes that are sisters.

The structure of the local case affixes advocated for in this paper correctly captures the facts about the implicational universals of the terminal nodes. It also correctly predicts possible and impossible portmanteau morphemes.

5. Conclusion

In this paper I have presented results of the survey of 62 languages with complex local case morphology, drawn from 5 language families and several language isolates. The local case morphology of all the languages surveyed conforms, without exception, to the template in (64). This template shares with recent analyses of spatial PPs (Koopman 2000, den Dikken 2006, Svenonius to appear) the view that there is more structure than a simple locative/directional division (as in Kracht 2002). However, it differs from previous accounts, on the one hand, in rejecting the view that the locative is a subset of the directional structure, and, on the other hand, in positing a more articulated geometry, rather than a uniformly left/right branching structure. I have supported my analysis by data on attested and unattested portmanteau morphemes, as well as by implicational universals. I have also suggested what features characterize each node in the structure. Nevertheless, this paper has not addressed such issues as case agreement between nouns and their modifiers, the role of non-local cases that are used in the formation of local case forms in some languages. These issues are to be addressed in future work.

References

- Blake, Barry. (1994). *Case*. Cambridge: Cambridge University Press.
- Bobaljik, Jonathan. (2000). The ins and outs of contextual allomorphy. In Kleanthes K. Grohmann and Caro Struijke, eds., *University of Maryland Working Papers in Linguistics vol.10: Proceedings of the 1999 Mayfest on Morphology*. Department of Linguistics, University of Maryland, College Park, MD. 35-71.
- Calabrese, Andrea. (2006). On absolute and contextual syncretism. Ms., University of Connecticut.
- Chung, Inkie. (2007). Ecology at PF: A study of Korean phonology and morphology in a derivational approach. Ph.D. dissertation, University of Connecticut.
- Comrie, Bernard, and Maria Polinsky. (1998). Great Daghestanian hoax. In, *Case, Typology, and Grammar: In honor of Barry J. Blake*, Anna Siewerska and Jae Jung Song (eds.), pp.95-115. Amsterdam: John Benjamin.
- den Dikken, Marcel. (2006). On the functional structure of locative and directional PPs. Ms., CUNY.
- Halle, Morris and Alec Marantz. (1993) Distributed morphology and the pieces of inflection. In Kenneth Hale and Samuel J. Keyser, eds., *The view from Building 20: Essays in linguistic honor of Sylvain Bromberger*. Cambridge, Mass.: MIT Press. 111-176.
- Koopman, Hilda. (2000). Prepositions, postpositions, circumpositions and particles: The structure of Dutch PPs. In *The syntax of specifiers and heads*, Hilda Koopman (ed.), pp. 204–60. London: Routledge.
- Kracht, Marcus. (2001). The combinatorics of cases. *Journal of language and computation* 3.
- Kracht, Marcus. (2001). On semantics of locatives. *Language and Philosophy* 25: 157–232.
- Radkevich, Nina. (2008). Local cases. Ms., University of Connecticut.
- Riemsdijk, Henk van & Riny Huybregts. (2001). Location and locality. Ms., Tilburg University
- Svenonius, Peter. (to appear). Spacial P in English. In *The Cartography of Syntactic Structures, vol. 6*, eds. Guglielmo Cinque and Luigi Rizzi (eds.) Oxford: Oxford University Press.
- Vinogradov, V.V., ed. (1967). *Jazyki narodov SSSR. T.I-V*. Moscow: Nauka.

Williams, Edwin. (2003). *Representational Theory*. Cambridge, Mass: MIT Press.

Zwarts, Joost. (2005). Prepositional aspect and the algebra of paths. *Linguistics and Philosophy* 28: 739-779.

Zwarts, Joost. (2006). *Aspects of typology of direction*. Ms., Radboud University & Utrecht University.

Appendix 1: Languages surveyed

- (1) **Daghestanian** (Agul, Akhvakh, Andi, Archi, Avar, Bagvali, Batsbi, Bezhta, Botlikh, Budukh, Chamalal, Chechen, Dargwa, Ginukh, Godoberi, Hinalug, Hunzib, Ingush, Karata, Lak, Lezgian, Rutul, Tabasaran, Tindin, Tsakhur, Tsez, Xvarshil).
- (2) **Finno-Ugric** (Erza, Estonian, Finnish, Ižor, Karelian, Khanty, Komi-Permian, Komi-Zyrian, Mansi, Mari (Eastern and Mountain), Mokša, Saam, Udmurt, Veps, Votic).
- (3) **Samoyed** (Enets, Nenets, Nganasan, Selkup).
- (4) **Manchu-Tungusic** (Even, Evenki, Nanai, Negidal, Oroch, Orok, Ulchi, Udeghe).
- (5) **Chukotko-Kamchatkan** (Alutor, Chukchi, Itelmen, Kerek, Koryak).
- (6) **Eskimo-Aleut** (Yupik).
- (7) **Language isolates** (Ket, Nivkh, Kolyma Yukaghir, Tundra Yukaghir).

Appendix 2: Case definitions by Blake (2004).

Ablative case expresses the role of the source, which is expressed by ‘from’ in English.

Adessive case expresses ‘at’ or ‘near’.

Allative case expresses ‘to’.

Approximative case

Elicative case expresses ‘out of’.

Essive case indicates location.

Illative case expresses ‘into’.

Inessive case expresses ‘inside’

Prolative case expresses ‘along’.

Terminative case expresses the endpoint.

Translative case expresses ‘through’.

Versative case expresses ‘towards’.