

# Locality in Post-Syntactic Operations\*

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## 1. Introduction

The status of movement-like operations that (among other things) resolve the dependencies of clitics and affixes has been the topic of a voluminous literature. Here we develop a theory that correlates the locality of the post-syntactic process with the stage of the (PF-)derivation at which the operation occurs, building on the work of Marantz (1984 and subsequent work) and Bobaljik (1994, 1995). The correlations are framed in a theory of the grammar in which the syntactic derivation assembles and manipulates bundles of abstract features, which are then realized phonologically after the syntax (*Late Insertion*; see below). The proposal is that the locality properties of a Merger operation are determined by the stage in the derivation at which the operation takes place: specifically, Mergers which take place before Vocabulary Insertion, on hierarchical structures, differ from Merger which takes place post-Vocabulary Insertion/linearization. The paper is devoted to (1) a demonstration of different locality properties at play in post-syntactic movements; (2) the development of a model of Morphology in which the locality differences are situated in a sequential derivation; and (3) case-studies based on the model. Given this agenda, discussion falling outside of the above points will be limited in scope.

## 2. Background Assumptions

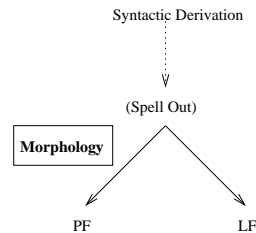
In this section we provide a sketch of our background assumptions about the structure of the grammar. We assume a theory in which morphology interprets the output of the syntactic derivation (Distributed Morphology, Halle 1990, Halle and Marantz 1993, 1994, Noyer 1997 and related work). The basic elements of the syntactic computation are abstract features, which appear in bundles as terminal

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nodes. Universal as well as language-specific well-formedness conditions determine in what manner these features may combine to form syntactic categories, the atoms of syntactic representation, which we call here *morphemes*. We reserve the term *morpheme* in this model to denote terminal elements in syntactic or morphosyntactic representations; we use the term *signal* (equivalently, *exponent*) to denote the phonological expression(s) of a morpheme. *Overt syntax* denotes those operations which assemble and manipulate this collection of morphemes into a hierarchical structure that is the input to computations concerned with morphological and phonological expression (PF) and aspects of semantic interpretation (LF).

The kinds of operations which take a representation from the PF/LF branching to its phonological form comprise the (*PF*) *Spell-Out* of that representation; the module of grammar responsible for Spell-Out is *Morphology*. That is, we use ‘Morphology’ here as a cover for a series of operations that occur on the PF branch following the point at which the syntactic derivation splits between PF and LF. There is no Lexicon in this model of grammar; word-formation takes place either in syntax or through post-syntactic operations during Morphology.



### 2.1. Morphemes and Signals

A number of independent operations occur on the PF branch, and some of these are of direct relevance to the present study. To begin with, not all morphemes relevant to pronunciation are present in syntax prior to Spell-Out and Morphology. In other words, not all word constituents are syntactic entities; many are not and are purely morphological (Noyer 1997). Certain structural positions within words and perhaps phrases are inserted at Morphology subject to various conditions. For example, many languages require noun and adjective stems to be augmented by case morphemes which are not themselves syntactic projections. These morphemes must be added post-syntactically during Morphology, as below:

- (1) Noun  $\rightarrow$  [ Noun + Case<sub>Noun</sub> ]

In the terminology of Embick (1997), such inserted morphemes are called *dissociated*, since the information which their signalization conveys is partly separated from the original locus of that information in the phrase-marker. Typical dissociated morphemes include Case and Agreement in at least some languages

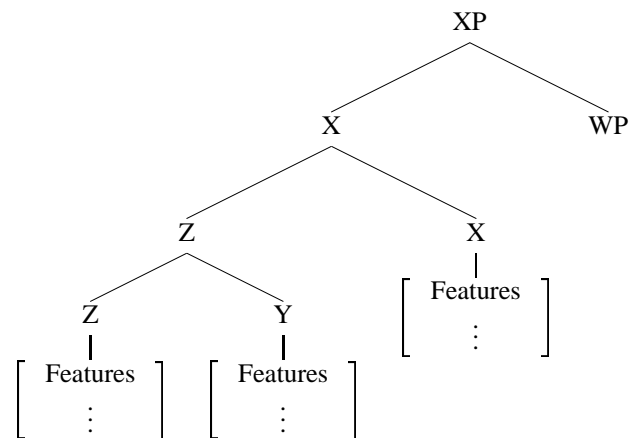
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(see e.g. Marantz 1992): these morphemes reflect certain syntactic properties (or configurations) but do not in any sense contribute these properties to the syntax. Dissociated morphemes are not interpreted at LF, since they are inserted only at Spell-Out. Hence, dissociated morphemes must signalize properties, either configurational or featural, already present in a syntactic structure before Spell-Out.

Following Halle & Marantz (1993) we adopt the term *Vocabulary* to denote the list of phonological signals and their privileges of occurrence. Each *Vocabulary Item* is a phonological representation, paired with a set of conditions on its insertion. Vocabulary Items are inserted into terminal nodes following the syntactic derivation; because terminals are only provided with specific Vocabulary Items post-syntactically, this is referred to as *Late Insertion*.

We use the term *terminal elements* or, equivalently *heads* to refer to the basic atoms of phrase-structure, which consist of abstract morphemes; that is, bundles of features. A variety of operations, including head-adjunction in syntax, morpheme insertion at Morphology, and the post-syntactic Mergers to be studied below, can produce  $X^0$  elements with internal structure such as in (2) :

- (2) Y adjoined to Z; Z+Y adjoined to X



When Vocabulary Insertion occurs, the Vocabulary is searched for items to be inserted into the structure. For certain morphemes, Vocabulary Insertion is deterministic and only one choice is possible in any given context. Following Harley and Noyer (1998), we will call such morphemes *f-morphemes*: typically such morphemes correspond to ‘functional’ projections in syntax. For *f-morphemes*, the Vocabulary Item with the largest subset of the features present

on the terminal node is inserted.<sup>1</sup> For other morphemes there exists a choice as regards the signal which may be inserted; we call such morphemes *Roots*. Unlike the signals inserted into f-morphemes, the signals for Roots are not in competition with each other and any Root-signal licensed in a given environment may be inserted.

More concretely, suppose that in (2)  $Z = \text{Noun}$ ,  $Y = \text{Number}:[\text{dual}]$  and  $X = \text{Case}:\text{Instrumental}$ .<sup>2</sup> In the Vocabulary of Mansi, a Uralic language, the most specific signals for Number:[dual] and Case:instrumental will be  $\text{əy}$  and  $\text{təl}$  respectively (Kálmán 1965). For the Noun morpheme there exist many choices, naturally, but the following forms exemplify possible outcomes:

- (3) a.  $\text{pūt-əy-təl}$   
       kettle-DUAL-INST  
       ‘by means of two kettles’  
       b.  $\text{ēry-əy-təl}$   
       song-DUAL-INST  
       ‘by means of two songs’

## 2.2. Morphological Merger

Morphological Merger, as first proposed by Marantz, was originally a principle of well-formedness between levels of representation in syntax; in Marantz (1988:261) Merger is generalized as follows:

- (4) **Morphological Merger**  
 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  $Y$ .

What Merger does is essentially ‘trade’ or ‘exchange’ a structural relation between two elements at one level of representation for a different structural relation between the ‘heads’ of these elements at a subsequent level. Merger can therefore be schematized as follows:

$$(5) A\mathfrak{R}B \rightarrow A'\mathfrak{R}'B'$$

Exactly what relations may be traded, i.e. what  $\mathfrak{R}$  and  $\mathfrak{R}'$  are, as well as the elements involved, i.e. what  $A, B$  and  $A', B'$  are, depends on the level at which the Merger occurs.

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<sup>1</sup>See Halle (1997), but certain complexities arise in defining the precedence relations among competing Vocabulary Items (see Harley & Noyer 1999:5 for discussion)

<sup>2</sup>For simplicity we use the label *Noun* for the Root here, but in so doing we are not necessarily committed to a view that traditional part-of-speech labels partition Roots in syntax. See Marantz (1997) and Harley and Noyer (1999) for discussion.

The theory that we present here follows the insight that Merger is an operation which occurs in structural configurations which vary with the point of the derivation at which the Merger operation occurs. For the sake of clarity, we will introduce two distinct terms to denote Mergers at different points in the post-syntactic derivation. The proposal is that there are in fact at least two varieties of Merger, depending upon whether Merger occurs in (a) in Morphology before Vocabulary Insertion; or (b) in Morphology after Vocabulary Insertion.<sup>3</sup> The pre-VI Merger is *Lowering*; it operates in terms of hierarchical structure. The Merger of type (b), *Local Dislocation*, operates in terms of linear adjacency. We now illustrate each of these operations with examples from English, and then present a model of Merger operations that will serve as the basis for a series of case-studies.

### 3. Lowering vs. Local Dislocation

#### 3.1. Lowering

Because we adopt the view that phonological expression of complex words is determined by information provided by the syntactic derivation, in certain instances Lowering movement will be required to unite syntactic terminals which are phonologically spelled together but not joined in overt syntax (by Raising). Here, the head  $X$  lowers to  $Y$ , the head of its complement:

(6) *Lowering of  $X^0$  to  $Y^0$*

$$[_{XP} X^0 \dots [_{YP} \dots Y^0 \dots ] ] \rightarrow [_{XP} \dots [_{YP} \dots [_{Y^0} Y^0+X^0 ] \dots ] ]$$

In English, as opposed to a number of other languages,  $V$  does not move to  $T$  in the overt syntax. However, Tense is realized on  $V$  morphologically (except when negation appears, or when T-to-C movement has occurred). English Tense thus Lowers to  $V$ , the head of its complement:<sup>4</sup>

(7) a. Mary[ $_{TP} t_1$  [ $_{VP}$  loudly play-ed<sub>1</sub> the trumpet]]

<sup>3</sup>Another potential type of Merger, *Prosodic Inversion* (Halpern 1992b), involves the trading of relations at the level of Prosodic domains, such as Phonological Word and Phonological Phrase. We will not be discussing Prosodic Inversion in detail here, but it is easily incorporated within our proposals as a variety of Merger operating immediately before Phonology.

<sup>4</sup>On a Strict Lexicalist theory such as Chomsky 1995, *play-ed* is fully inflected before syntax in the Lexicon; its tense features need not be checked until LF. When Spell-Out occurs, *play-ed* already has the inflectional material with it. However, DM admits no Lexicon in which *play-ed* might be constructed before syntax. Instead, Tense must Lower to the Verb during Spell-Out, lest Tense remain *in situ* and be supported by dummy *do* as in ungrammatical (7b).

- b. \*Mary did loudly play the trumpet

Because Lowering involves adjunction of a head to a head, and these heads need not necessarily be linearly adjacent, Lowering has a (potentially) non-local, that is, non-adjacent, character. As Bobaljik (1994) argues, an intervening adjoined adverb such as *loudly* in (7a) does not prevent T from Lowering to V. In sum, this post-syntactic operation is one which skips potentially intervening adjuncts, and adjoins T to the head of its complement (that is, *v*).

### 3.2. Local Dislocation

A second variety of Merger, which we term *Local Dislocation*, occurs after Vocabulary Insertion. In Local Dislocation the relation traded in for ‘affixation’ is not hierarchical, but rather linear precedence and adjacency. By hypothesis, linear ordering is not a property of syntactic representations but is imposed at PF in virtue of the requirement that speech be instantiated in time. It is therefore natural to assume that linear ordering is imposed on a phrase marker at the point in the derivation when phonological information is inserted, that is, at Vocabulary Insertion.

- (8) *The Late Linearization Hypothesis*

The elements of a phrase-marker are linearized at Vocabulary Insertion.

Our idea that Local Dislocation is a variety of Merger distinct from Lowering is based on Marantz’s (1988) position that the notion *head of a constituent* relevant to Merger is defined differently at different levels of the grammar. The implementation of this position here is that the properties of Merger differ depending upon whether Merger applies on a linearized or unlinearized structure. Specifically, before linear order is imposed on a phrase-marker, headedness is defined in terms of structure: where a constituent  $C = X(P)$ , then the head of  $C$  is  $X^0$ . After linearization, this no longer holds and the head is defined in terms of peripherality within the constituent. To see how this is so, consider the following structure:

- (9)  $[_{XP} X [_{YP} [_{ZP} Z] Y]]$

Here  $X$  takes  $YP = [ZP Y]$  as its complement, where  $ZP$  is either a complement to  $Y$  or an adjunct to  $YP$ . We will use the notation  $a * b$  to denote a requirement that  $a$  must linearly precede  $b$  and be adjacent to  $b$ . A potential linearization of this structure is:

- (10)  $[X * [Z * Y]]$

Here  $X$  must immediately precede  $[Z * Y]$  and  $Z$  must immediately precede  $Y$ . In the syntactic structure (9) from which (10) originated,  $Y$  is the ‘head’ of the

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constituent which  $X$  takes as its complement. In syntax,  $Y$  could raise to  $X$ ; likewise  $X$  could lower to  $Y$  across  $ZP$ . But Local Dislocation does not refer to (9) but rather to (10). The relations exchanged are now ones of linear precedence and adjacency (\*). Specifically, Local Dislocation can convert (10) to (11):

$$(11) \quad [[Z^{\circ} Z+X] * Y]$$

In (11),  $X$ 's \* relation to  $[Z * Y]$  has been exchanged for a relation of adjunction to the left-peripheral element of  $[Z * Y]$ , namely  $Z$ . (11) is a legitimate transformation of (10) because both \* relations in (10) have been either preserved or exchanged appropriately by Merger. In (10)  $Y$  must immediately follow and be adjacent to  $Z$ . In (11) this relationship is maintained because  $Y$  still follows  $Z^{\circ}$ , which is now however internally complex as  $Z+X$ .

As Marantz (1988) shows, the idea that Local Dislocation Merger exchanges relations of adjacency for those of adjunction places restrictions on the structures in which two elements can be inverted in the string. Our interpretation of these restrictions is as follows: if  $X$  is an element peripheral in some constituent  $C$ ,  $X$  will not be able to invert with an element  $Y$  not also contained in  $C$ . Consider the following:

$$(12) \quad \begin{array}{l} \text{a. } [\dots Y] * [C X * Z] \\ \text{b. } [\dots X+Y] * [C Z] \\ \text{c. } [\dots Y+X] * [C Z] \end{array}$$

Given a pre-Dislocation structure such as (12a),  $X$  cannot 'escape' the constituent  $C$  to invert with  $Y$  as in (12b), since in so doing  $X$  would not properly maintain its requirement of (left-)adjacency with  $Z$ . This should be contrasted with the derivation of (11), where  $X$  undergoes an inversion with an element ( $Z$ ) which is *contained within* the constituent which  $X$  is originally peripheral in.

On the other hand, string-vacuous (i.e. non-inverting) Local Dislocation is not subject to these same locality conditions (although of course it affects only string-adjacent elements). Essentially, string-vacuous 'rebracketing' is freely permitted, much as proposed by Sproat (1985). For example, in (12c)  $X$  may 'escape' the constituent  $C$  which it was originally peripheral within, since it will still maintain a left-adjacency relation to  $Z$ .

To reiterate, there is an important difference between Lowering Merger and Local Dislocation Merger. Lowering Merger is sensitive to syntactic headedness and can therefore affect elements which are not string-adjacent. Local Dislocation, however, is sensitive to relations of adjacency and precedence between constituents, and not to syntactic headedness directly. Thus, Local Dislocation must always be *local* as the name suggests. Only adjacent elements can be reordered by the operation, and an intervening (syntactic) adjunct cannot be ignored.

### 3.3. Illustrating the Two Operations

The formation of English Comparatives and Superlatives of the type *tall-er*, *tall-est* provides a clear case in which a Vocabulary-specific operation is constrained to apply under linear adjacency. To begin with, we take the syntactic structure to be one in which the Superlative or Comparative features dominate the position of the Adjective (Abney 1987); we will refer to this morpheme in either case as CMPR. The realization of these morphemes is dependent upon whether or not they combine with the Adjective they dominate. As is well-known, there is a prosodic condition on the host; CMPR can only combine with an Adjective with one metrical syllable:

- (13) a. John is smart-er than Bill.  
 b. John is mo-re intelligent than Bill.  
 c. \* John is intelligent-er than Bill.  
 d. ?\* John is mo-re smart than Bill.

The correlation that we establish here is simple: the suffixation of CMPR is dependent upon the prosodic shape of the host, and therefore happens after the insertion of specific adjectives. The information that is required for the process to occur is Vocabulary-specific; and, because structures are linearized by Vocabulary Insertion, the process is defined over a linearized structure. Accordingly, the CMPR morpheme cannot appear on the Adjective when there is an intervening adverbial; this is seen clearly with the superlative:<sup>5</sup>

- (14) a. Mary is the mo-st amazingly smart person...  
 b. \* Mary is the *t* amazingly smart-est person...

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<sup>5</sup>This point can also be illustrated with the Comparative, but with greater difficulty. The reading for this is that with the Comparative there are two distinct scopal readings for the Adverb; one in which it scopes over the entire Comparative-Adjective, and one in which it intervenes between CMPR and the Adjective. Thus the following is grammatical, but only on a reading in which the Adverb takes scope over the Comparative:

- (i) The DuPonts are amazingly *t* rich-er than the Smiths.

That is, the degree to which they are richer is amazing. The syntactic structure is thus one in which the Adverb dominates the CMPR-ADJ. This may be compared with a case in which the Adverb does not take scope over the comparative; in such cases, no combination of Adjective and CMPR is possible:

- (ii) The DuPonts are mo-re amazingly rich than the Gettys.

That is, both are amazingly rich, but the DuPonts are more so. The reason for this is that with the combined Comparative form the only structure in which the Adverb does not intervene between the position of CMPR and the potential host Adjective.



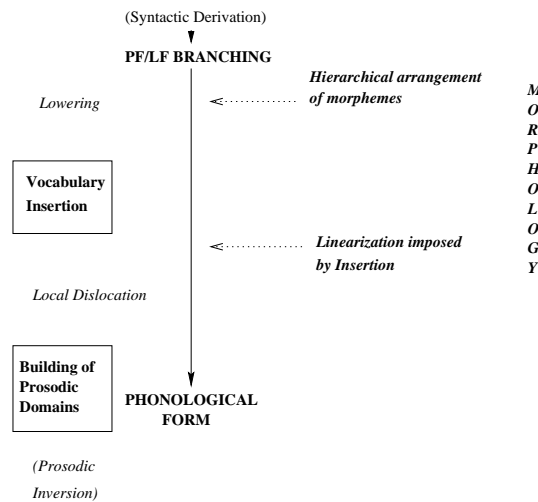
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When *amazing* appears as a modifier of *smart*, it is structurally between the position of the CMPR morpheme and the adjective. Accordingly, it is linearized between these two elements. Its presence in the position prohibits comparative *-st* from being Merged with *smart* (14b), forcing the presence of *mo-st*.

### 4. A Model

The device of Morphological Merger as developed by Marantz (1988) captures the generalization that clitics are of essentially two types, ‘peripheral’-clitics, which are either at the edge of a maximal projection or in peninitial or penultimate ‘second’-position within that phrase, and ‘head’-clitics, which adjoin to the head of a phrase. On the present proposal, peripheral-clitics move to their surface position by Local Dislocation, while head-clitics undergo Raising or Lowering to a head, or else are Dissociated morphemes inserted directly on a head.<sup>6</sup>

Figure 2 illustrates the PF branch of the grammar as we envision it.



The architecture of this model, in particular the ordering of events within the derivation, makes particular predictions about what can and cannot happen in Morphology. In this section we make these predictions precise; the remainder of the paper exemplifies and defends these ideas.

<sup>6</sup>On the view we present *Prosodic Inversion*, defined by Halpern (1992b) as operating in terms of prosodic subcategorization, would only apply to sentence-peripheral elements. That is, if a clitic has a dependency that is purely prosodic, it would, all other things being equal, simply *lean* on a host rather than undergoing Merger.

#### 4.1. The Local Dislocation Hypothesis

By the Late Linearization Hypothesis (8), linear order is imposed on a string only at Vocabulary Insertion, and after linearization, Local Dislocation Merger can manipulate only string-adjacent elements. From this premise it follows that if a movement operation is sensitive to properties which are supplied at Vocabulary Insertion, it will necessarily apply only to string-adjacent elements. Properties which are supplied at Vocabulary Insertion include the specific identity of Vocabulary Items, such as whether *beech* has been inserted into a morpheme, as opposed to *elm*, or *poplar*, including any idiosyncratic properties of the inserted Item, such as its phonological features or its inflectional or other diacritical class features. If a movement operation is sensitive to such particular properties of Vocabulary Items, we call it *vocabulary-sensitive*. The *Local Dislocation Hypothesis* can then be stated:

(15) *The Local Dislocation Hypothesis*

If a movement operation is vocabulary-sensitive, it involves only string-adjacent items.

For example, suppose A, B and C are terminal nodes:

(16) [A B C]  $\not\rightarrow$  [B C+A] or [B A+C]

If the movement of A to C depends on the specific Vocabulary Items inserted into A or C and not solely to syntactic properties of A and C, then the movement is blocked where some other element B intervenes.

Effectively, the Local Dislocation Hypothesis establishes an important correlation between the locality of a movement operation and what would have been called the ‘selectional’ properties of the clitic in the Lexicalist approach of Klavans (1985), Klavans (1995), or the Autolexical Syntax theory of Sadock (1991). Where a clitic demands a host having a particular identity, such as inflectional class, morphological category, or phonological weight, then in our terms the operation is vocabulary-sensitive and the clitic and the host must be string-adjacent prior to Merger. Inversely, where the clitic element is indifferent to the Vocabulary Item which fills its host morpheme, then it is possible (although not necessary) for the clitic to reach its host by Raising or Lowering, operations which are permitted to cross syntactic adjuncts.

#### 4.2. Late Lowering

While the Local Dislocation hypothesis is the main focus of the present investigation, we will also point to several other predictions made by the model depicted in Figure 2. As shown there, Lowering occurs in Morphology, after any application of syntactic Raising. It follows from this that while Raising may remove the environment for Lowering to apply, the opposite can never hold.

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(17) *The Later Lowering Hypothesis*

All Lowering in Morphology follows all Raising in Syntax. Lowering can never remove an environment for Raising.

In other words, Lowering operates only on the structure that is the output of syntax, i.e. the structure after all overt syntactic operations have occurred. For example, English Lowering of T to v cannot apply where vP has been fronted to a position higher than T (cf. also Bobaljik 1995):

- (18) a. Mary said she would quietly play her trumpet, and [<sub>vP</sub> quietly play her trumpet]<sub>1</sub> she did *t*<sub>1</sub>.  
b. \* Mary said she would quietly play her trumpet, and [<sub>vP</sub> quietly played<sub>2</sub> her trumpet]<sub>1</sub> she *t*<sub>2</sub> *t*<sub>1</sub>.

In (18a), vP fronting makes it impossible for postsyntactic Lowering to move T to v; (18b) shows what would result if Lowering could precede vP fronting. We predict that no language should permit Lowering of a head Y into an XP that subsequently raises above Y.

### 5. Illustration: Lowering and Local Dislocation in South Slavic

The South Slavic languages Bulgarian and Macedonian show a ‘suffixed’ definite article, which has (1) a clitic-like distribution within the DP.<sup>7</sup> The two languages show distinct patterns for the operation that places the definite on a host, which correspond to the operations of Lowering and Local Dislocation defined above.

#### 5.1. Bulgarian

The Definite in Bulgarian appears suffixed to nominals, or, when these are modified by Adjectives, suffixed to the first Adjective in a sequence:

- (19) Bulgarian  
a. kniga-ta                    *book-DEF*  
b. xubava-ta kniga        *nice-DEF book*

With possessive pronouns, the DEF appears suffixed to the pronominal element:

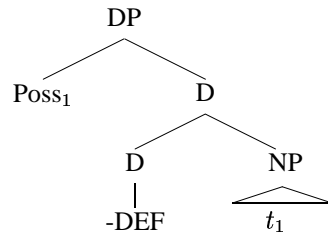
- (20) moja-ta xubava kniga        *my-DEF nice book*

The pattern here makes sense if examples of this type are generated with syntactic movement of the possessive pronominal to SPEC of DP. Rather than Lowering, the DEF element then cliticizes to the pronoun in the Specifier position:

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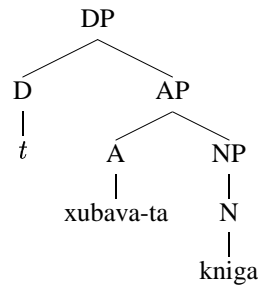
<sup>7</sup>There is an extensive literature on this topic; cf. Elson (1976), Scatton (1980), Sadock (1991), and Halpern (1992a), among others.

(21) Possessives and DEF



In cases with pre-nominal modifiers such as adjectives, the structure of the DP is assumed to be along the lines of Abney (1987), in which adjectives are heads taking NP arguments. In this structure, the A head is the target of Lowering from D:

(22) Adj/Noun



When other elements, such as adverbs, appear within between the NP and D, there is a different pattern. Adverbs may not host the Definite element (23a), nor do they block the Merger operation (23b):

(23) Bulgarian

- a. \* mnog-ət star teatər  
     very-DEF old theater  
     ‘the very old theater’
- b. mnogo starij-ə teatər

The pattern displayed above fits well with the idea of Merger at the level of category, i.e. Lowering, which skips intervening adverbials. The Definite element Lowers across intervening material to the immediately dominated head, subject to certain morphophonological requirements. The fact that DEF does not appear on the adverb is then purely structural; when DEF undergoes Merger, it targets the head of its complement, stated in terms of syntactic headedness. The adverb, being an adjunct, cannot be the target of this operation.

**5.2. Macedonian**

Macedonian forms an interesting contrast with Bulgarian; the data are taken from Sadock (1991) and Börjars (1992). In addition to appearing on nouns, DEF appears on other elements, such as adjectives, within the DP:

(24) Macedonian

- |    |                    |                            |
|----|--------------------|----------------------------|
| a. | čovек-ot           | <i>man-DEF</i>             |
| b. | dobr-iot čovek     | <i>good-DEF man</i>        |
| c. | dobr-iot mal čovek | <i>good-DEF little man</i> |

It also appears on possessive pronominals:

(25) moj-ot časovnik      *my-DEF watch*

Up to this point the pattern is exactly as it is in Bulgarian. However, with adverbials there is a different pattern; the Definite may not appear on the adverb, nor may it appear on the element following the adverb. The operation does not apply (compare with the parallel Bulgarian examples above in (23)):

(26) Macedonian

- |    |                                |                          |
|----|--------------------------------|--------------------------|
| a. | *mnogu-ot/ta/to/te golem čovek | <i>very-DEF big man</i>  |
| b. | *mnogu golem-iot čovek         | <i>very big-DEF man</i>  |
| c. | onoj mnogu golem čovek         | <i>that very big man</i> |

Thus while adverbs may not host DEF, exactly as in Bulgarian, the adverbs here do block the Merger operation; otherwise (26b) would be grammatical, like its Bulgarian counterpart.

There are two factors to consider in analyzing the behavior of Macedonian DEF. First, and purely in terms of the locality of the operation this behaves like a case of Local Dislocation. Intervening elements, including e.g. Adverbials, will prevent the DEF from adjoining to a following Adjective. At the same time, the operation will not suffix the DEF to an adverb. This is where the second factor plays a role. Sadock (1991) argues that what is relevant about the restrictions on host for the article is morphological: it may only appear on Nouns and Adjectives because only these inflect for Gender and Number. There is a further condition requiring that the host element be capable of inflection:

(27) X may be X-DEF only if X = X-Q<sub>Gender/Number</sub>

For this reason, the DEF is prevented from under going Local Dislocation and appearing on the Adverb.

### 5.3. Discussion

The patterns of Definite suffixation in Bulgarian and Macedonian, although quite similar, illustrate the two types of locality constraints associated with Lowering and Local Dislocation.

In Bulgarian, the fact that DEF skips over Adverbs to appear on the following Adjective shows that the operation does not apply under Adjacency. In Macedonian, DEF does not bypass Adverbs; this points to an analysis in terms of Local Dislocation. At the same time, DEF does not suffix onto linearly adjacent Adverbs. There is apparent category-sensitivity in its hosts. Sadock's position, as noted above, was that Macedonian DEF only attaches to elements with Desinences, i.e. Nouns and Adjectives. The operation in question would be dependent upon the presence of these Dissociated positions, i.e. late in the Morphology. This is of interest, because the operation in question applies to all DEF elements, without reference to what form they will take. Viewed from the perspective of the moving element, the operation is vocabulary insensitive. If Sadock's position about the hosts is correct, however, then there is a late-sensitivity such that only hosts with certain morphological properties are potential targets. Returning to Bulgarian, given that the operation moving DEF is Lowering, there is no possibility that an Adverb will be targeted, given that the Adverb will never be the immediately dominated head relevant for Lowering.

## 6. Refinements of the Model: MWords and Subwords

The preceding sections have illustrated the contrast between Lowering and Local Dislocation and have shown how the locality conditions of each are identified with distinct stages of the model of grammar we espouse. In this section, we refine our definitions of the elements which undergo Merger. We introduce a distinction between two types of objects in Morphology, which we call *Morphosyntactic Words* and *Subwords*, and demonstrate that movement of each by Merger obeys distinct locality effects.

### 6.1. Definitions

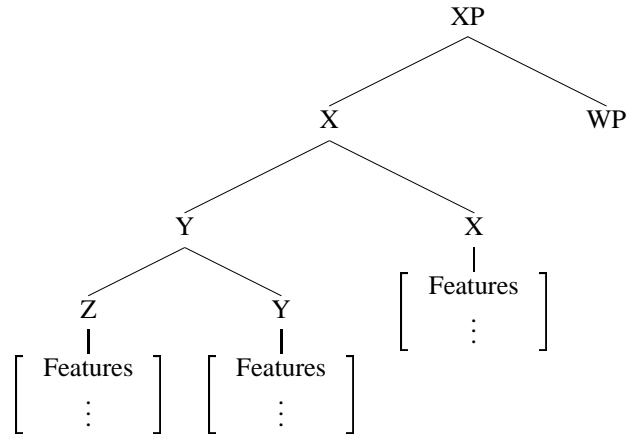
First, we define the *Morphosyntactic Word* as follows:

- (28) At the input to Morphology, a node  $X^0$  is (definitionally) a *Morphosyntactic Word* (MWd) iff  $X^0$  is the highest segment of an  $X^0$  not contained in another another  $X^0$ .

For example, consider the following structure:

- (29) Z adjoined to Y; Z+Y adjoined to X

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In (29)  $X^0 = Z+Y+X$  constitutes an MWd but  $Y^0 = Z+Y$  is not an MWd (at least after adjunction to  $X^0$ ), since  $Y^0$  is dominated by  $X^0$ .

Second, we define *Subword* as follows:

- (30) A node  $X^0$  is a *Subword* if  $X^0$  is a terminal node and not an MWd.

In (29),  $Z^0$ , the lower segment of  $Y^0$ , and the lowest segment of  $X^0$  are all Subwords.<sup>8</sup>

In sum, any terminal which has undergone head-movement in syntax to adjoin to another head, or any dissociated morpheme adjoined to another head at Morphology, will count as a Subword. As we will demonstrate below, M-Words and Subwords are the basic atoms of post-syntactic operations, and these distinct objects impose important restrictions on the types of operation that may affect them.

### 6.2. Two kinds of Local Dislocation

Both MWds and Subwords can be moved by Local Dislocation.<sup>9</sup> We propose that when an MWd is moved by Local Dislocation, it adjoins to an adjacent MWd, and when a Subword is moved by Local Dislocation, it adjoins to an adjacent Subword. This type of restriction mirrors the commonly-held assumption that syntactic movement treats heads and phrases differently. We first review an example of each type and then consider the formal properties of Merger that lead to this restriction.

<sup>8</sup>Thus in some sense a *Subword* is always a terminal consisting of a feature bundle, or, if node labels are required, an X immediately dominating a feature bundle and nothing else.

<sup>9</sup>Our proposal does not, however, allow constituents of MWds to move by Raising (Excoporation) or Lowering.

### 6.2.1. Local Dislocation of MWds

The Latin clitic *-que*, itself an MWd, attaches not to the first Subword of its complement, but to the first MWd of its complement:

- (31) a. [bon+ī [puer+ī [-que [bon+ae [puell+ae]]]]]  
 good+nom.pl boy+nom.pl and good+nom.pl girl+nom.pl →  
 b. (after Merger): bon+ī puer+ī bon+ae+que puell+ae  
 ‘good boys and good girls’  
 c. \*bon+ī puer+ī bon-que+ae puell+ae

Here *-que* does not interpolate inside the MWd *bon+ae*, even though this word is, by hypothesis, internally complex. In other words, given a structure as in (32), X an MWd, only (33a) is a legitimate transformation of (32), while (33b) is not possible.

- (32) [X \* [[<sub>W</sub> W+Y]\* Z]]  
 (33) a. [[<sub>W</sub> [<sub>W</sub> W+Y]+X ]\* Z]  
 b. [[<sub>W</sub> [<sub>W</sub> W+X]+Y ]\* Z]

The appearance of *-que* when it appears with Prepositional phrases adds a slight complication to this picture. With disyllabic prepositions, *-que* typically attaches to the P itself; but with many monosyllabic Prepositions, it attaches to the complement of P (Ernout and Thomas 1951:120):<sup>10</sup>

- (34) a. circum-que ea loca ‘and around those places’  
 contra-que lēgem ‘and against the law’  
 b. in rēbus-que ‘and in things’  
 de prōvinciā-que ‘and from the province’

In such cases, a string-vacuous variety of Local Dislocation applies to phonologically light (monosyllabic) Prepositions and their complement, uniting them into a single Subword:<sup>11</sup>

<sup>10</sup>Ernout/Thomas identify exceptions to this pattern, which are categorized into a few groups. First, certain fixed phrases; second, cases in which the complement of the preposition is either a demonstrative or a form of the third person pronoun *is*; and, third, cases in which the Preposition is repeated in each conjunct.

<sup>11</sup>Support for this position, which makes these prepositions proclitic on their complements, is found in Latin orthography, which occasionally treated monosyllabic prepositions as part of the same word as the complement; see Sommer (1914:294), Leumann et al. (1963:241).



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(35)  $-que * [ in * r\bar{e}+bus ] \rightarrow que * [ in+r\bar{e}+bus ]$

Subsequent to this, Local Dislocation of *-que* places it after the P+N unit, ignoring the Preposition, much as the adjectival desinence is ignored in the examples in (31) above:

(36)  $-que * [ in+r\bar{e}+bus ] \rightarrow [ in+r\bar{e}+bus+que ]$

Examples of this type illustrate two important points. First, there are two Local Dislocations at work, and they apply cyclically: the string-vacuous one uniting P and its complement, and then the outer application of Local Dislocation placing *-que* with respect to this derived unit. Second, the Mwd status of *-que* determines where it is placed in a derived object consisting of more than one Subword: it is placed after the entire derived Mwd, not after the adjacent Subword.

### 6.2.2. Local Dislocation of Subwords

On the other hand, where Local Dislocation targets Subwords, it adjoins these to adjacent Subwords. For example, in Huave, the reflexive affix *-ay* appears directly before the final inflectional affix of a verb, if any. Consider the following examples (Stairs and de Hollenbach 1981; Reflexive affix bold-faced):

(37) a. s-a-kohč-**ay**  
1-Th-cut-REFL  
'I cut myself'

b. s-a-kohč-**ay**-on  
1-Th-cut-REFL-pl  
'We cut ourselves'

(38) a. t-e-kohč-**ay**-os  
Past-Th-cut-Refl-1  
'I cut (past) myself'

b. \*t-e-kohč-as-**ay**  
Past-Th-cut-1-Refl

(39) a. t-e-kohč-as-**ay**-on  
Past-Th-cut-1-Refl-pl  
'We cut (past) ourselves'

b. \*t-e-kohč-**ay**-os-on  
Past-Th-cut-Refl-1-pl

Although *-ay* directly follows the root and precedes *-Vs* ‘1st person’ in (38a), *-ay* ‘reflexive’ follows *-Vs* ‘1st person’ in (39a).<sup>12</sup> We can account for these facts by assuming that *-ay* is structurally peripheral to the verb+inflection complex, but undergoes a Local Dislocation to left-adjoin to the rightmost inflectional affix:

- (40) a. [[s-a-kohč]on]ay → [[s-a-kohč]ay+on]  
 b. [[s-a-kohč]as]on]ay → [[s-a-kohč]as]ay+on]

### 6.2.3. Discussion

The Huave examples establish that Local Dislocation cannot be restricted to MWds. Dislocation of Subwords must also be permitted. But movement of an MWd to adjoin a Subword, or of a Subword to adjoin to an MWd, as in (33b), is apparently impossible. To obtain the correct restriction on inversion operations, it suffices to require that:

- (41) If a Merger operation exchanges an adjacency relation between two elements *A* and *B* for an adjunction relation, then *A* and the head of *B* are either both MWds or both Subwords.

Clearly the same restriction is standardly assumed to hold when the operation in question is syntactic movement: XPs adjoin to XPs and X<sup>0</sup>s adjoin to X<sup>0</sup>s (cf. Baltin 1991 for some discussion).

For the purposes of exposition, it will be convenient to notationally distinguish between instances of Merger of an MWd versus Merger of a Subword. To make explicit whether a particular Dislocation moves an MWd or a Subword, we will use the special symbol  $\oplus$  to denote adjunction of one Subword to another. The symbol + will continue to denote other types of adjunction as is standard.

## 6.3. Opaque Domains

The theory predicts certain interactions concerning domains that are accessible for Merger operations, and concerning the relative ordering of operations.

### 6.3.1. MWd Integrity

First, a complex X<sup>0</sup> created in syntax (or by Lowering) cannot be infixd within another X<sup>0</sup> during Morphology. In other words, ‘second’ position for an MWd is

<sup>12</sup>The 1st person suffix shows a complex alternation, partly the result of vowel harmony; we denote it here simply as *-Vs*.

after (or before) the first (last) MWd in a phrase and nowhere else.<sup>13</sup>

$$(42) X * [_{Y^o} Y * Z] \text{ --/} \rightarrow [_{Y^o} Y+X Z], \text{ where } X \text{ is an MWd}$$

### 6.3.2. MWds as Islands

Second, a Subword, i.e. a terminal node within a complex  $X^o$  created by Raising or through the insertion of dissociated morphemes in Morphology, can never adjoin to an element outside of that  $X^o$ . Schematically:

$$(43) X * [_{Y^o} Y * Z] \text{ --/} \rightarrow Y+X [_{Y^o} Z], \text{ where } X \text{ is an MWd and } Y \text{ is a subword.}$$

The islandhood of MWds for Local Dislocation has important ramifications for the relationship between the domains for allomorphy and phonological word domains, a topic we take up in section 7.1.1. Following this, we compare these specific restrictions with those made available in the theory of Klavans (1985) and Klavans (1995), showing that the proposed model excludes cases of clitics which are not in fact attested.

Before doing so, however, we illustrate Subword Local Dislocation further through an examination of the Standard Lithuanian verbal reflexive morpheme.

### 6.4. The Lithuanian Reflexive

The behavior of the reflexive morpheme *-si* in Standard Lithuanian (Senn 1966, Nevis & Joseph 1992) provides an important showcase for the interaction of Local Dislocations at the Subword level. In simple verbs such as (44a), *-si* appears as a suffix to the complex of verb stem + tense and agreement inflection (44b):

- (44) a. laikaũ  
         consider-1S  
         'I consider, maintain'
- b. laikaũ- si  
         consider-1S REFL  
         'I get along'

---

<sup>13</sup>Klavans (1995) and Halpern (1992b) (among others) discuss cases in which second position appears to be either after the first word or after the first phrase. On the present proposal, positioning after the first phrase cannot arise from Local Dislocation. It must be the case that either the initial XP in question has raised (for example by a topicalization fronting) to sentence-initial position, or else the clitic inverts with the first Phonological Phrase by Prosodic Inversion.

In verbs with certain ‘preverb’ prefixes, historically derived from adverbs, *-si* appears not after the verb + inflection but between the prefix and the verb:

- (45) a. iš- laikaũ  
 PR- withstand-1S  
 ‘I preserve, withstand’  
 b. iš- si- laikaũ  
 PR REFL withstand  
 ‘I hold my stand’

When two such prefixes appear before the verb, we find that the reflexive morpheme appears between the first and second of these:

- (46) a. pa- žinti  
 PR know  
 ‘to know [someone], to recognize’  
 b. su- si- pa- žinti  
 PR REFL PR know  
 ‘to become acquainted with’

Furthermore, when a verb is negated by the prefix *ne-*, the negation prefix appears before any preverbs, and reflexive *-si* is immediately to the right of negation (examples from Dambriūnas, Klimas and Schmalstieg 1972):

- (47) a. àš lenkiù  
 I bend.1S  
 ‘I bend’  
 b. àš lenkiúo -si  
 I bend.1S- REFL  
 ‘I bow (lit. I bend myself)’  
 c. àš ne- si- lenkiù  
 I NEG- REFL- bend.1S  
 ‘I do not bend’

The generalization emerging from these data is that *-si* appears as a suffix to the first prefix (of a certain type) on the verb; where there is no prefix, *-si* suffixes to the verb and inflection. In terms of Local Dislocation, *-si* has moved from a position as a prefix to the verb complex to second-position, where, crucially, the verb and inflection together count as a single ‘position.’ Like Latin *-que*, Lithuanian *-si* cannot be positioned between the stem and an inflectional

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suffix; but unlike *-que*, *-si* can be positioned inside of an MWd, namely between a prefix and a following stem or prefix.

Our analysis of these facts is as follows. We assume that in Lithuanian the preverbs are adjoined to the verb, and this complex moves to Negation if present, and further to Tense:

$$(48) \quad [{}_{TP} [\text{Neg}_i + [\text{PR} + \text{PR} + \text{V}]_2 ] + \text{T} [{}_{NegP} t_1 [{}_{VP} \dots t_2 ] ]$$

We take *-si* to be a Dissociated Morpheme inserted on T in Morphology, left-adjoined to the highest segment of T<sup>o</sup>, that is, to the entire [ $\dots$  V]+T complex.<sup>14</sup> From this position, it undergoes Local Dislocation. As a Subword and not an MWd itself, *-si* trades its relation of left-adjacency to the [ $\dots$  V]+T complex for a relation of (right-) adjunction to the left-peripheral Subword within this complex, namely the leftmost prefix:<sup>15</sup>

$$(49) \quad [-si * [\text{PR} \dots \text{V} * \text{T} ] ] \rightarrow [ [\text{PR} \oplus si \dots \text{V} * \text{T} ] ]$$

This procedure gives the correct results whenever the verb has a prefix or is negated. However, since both V and (the lower segment of) T are Subwords, we incorrectly predict that *-si* will dislocate to between V and T in a verb with neither Negation nor a Prefix:

$$(50) \quad [-si * [\text{V} * \text{T} ] ] \rightarrow * [ [\text{V} \oplus si * \text{T} ] ]$$

The reason this does not happen, evidently, is that V and T form an impenetrable unit to Local Dislocation. This fact reflects another, namely that in most Indo-European languages suffixes form closer phonological domains with stems than

<sup>14</sup>The *si* under discussion here is classified as ‘reflexive’ for convenience only. In fact, it appears in a number of different verbal types in Lithuanian, many of which are not actually reflexive. This pattern is typical of voice morphology that does not actually instantiate a syntactic terminal, although we cannot undertake a detailed analysis showing that this is the case here. For full distribution of this element in Lithuanian see Geniušienė (1987).

<sup>15</sup>The position of *-si* is not constant across Lithuanian dialects. Endzelins (1971) provides data from a dialect in which *-si* is suffixed to the verb+inflection complex even when there is a preverb:

- (i) su- prañta- si  
PR understand REFL  
‘(they) understand each other’

In such dialects, *-si* is presumably right-adjoined to (the highest segment of) T<sup>o</sup> and does not undergo any dislocation. Doubling of reflexives also takes place in certain dialects; Senn (1966: §401) reports that in Lower Lithuanian (*Niederlitausch*) *s(i)* appears after the verb when negation is present, but after verbal prefixes when these are present; in these latter cases, doubling is also possible, with a second *s(i)* appearing after the verb. We do not attempt a full analysis of such forms here.

do prefixes: prefixes are more ‘loosely’ attached than suffixes, and suffixes show more pronounced allomorphy conditioned by the stem than do prefixes. Where the suffix in question is T, this closer phonological affinity to the stem is directly at odds with the syntactic derivation, where, by hypothesis, T has attached last during syntactic head raising (48).

To express this restructuring, we propose that T in Lithuanian always undergoes string-vacuous Local Dislocation, adjoining to its left-neighbor V:

$$(51) [V * T] \rightarrow [{}_{V^0} V \oplus T]$$

Recall now that Local Dislocation manipulates Subwords, where these are defined as the terminal elements within an MWd. Because Subword status is defined before Local Dislocation, if the Subword  $T^0$   $\oplus$ -adjoins to the Subword  $V^0$  as in (51), the result is a single complex Subword and not two Subwords. It follows that subsequent Local Dislocation will treat the  $[V \oplus T]$  unit as a single ‘position’. This is indeed what we find, since *-si* dislocates to the left of  $[V \oplus T]$  as a whole.

The ordering of the two hypothesized Local Dislocations is not arbitrary: it is predicted by the principle of cyclic application. Since *-si* is adjoined to T, and T is adjoined to  $[... V]$ , then any dislocation operating over T and V will precede any dislocation operating over *-si* and T.

## 7. Clitics, Affixes, and Morphophonology in a Non-Lexicalist Model

### 7.1. Introduction

In the preceding sections we have made explicit some restrictions on the operations by which ‘dependent’ or ‘clitic’-like elements are situated at their positions of pronunciation. Specifically, we have proposed that these operations are distributed among various components of grammar: movement in syntax, Lowering and Local Dislocation in Morphology, as well as generation *in situ*, either in syntax, or in Morphology (‘dissociated morphemes’). All these operations are subject to distinct but clearly defined conditions of locality which serve to restrict the ways in which clitic-like elements may be pronounced in positions removed from their syntactically underlying locations. In this way, we depart significantly from Lexicalist theories such as Klavans (1995) and Klavans (1985) according to which there exists a ‘unitary phenomenon’ of cliticization. On the contrary, on our view ‘clitic’ is no more than a descriptive term for a group of items with a heterogeneous derivational history.

The following section compares the predictions made by our theory versus prominent Lexicalist approaches to clitic placement and behavior. We will show that insofar as Lexicalist approaches make empirically correct predictions, the same predictions arise in our approach. Second, we show that the restrictions

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of locality that are the main focus of the present paper introduce new and important further constraints not available to Lexicalist approaches.

### 7.1.1. Clitics vs. Affixes

Kanerva (1987), a study of the Finnish possessive (Px) suffixes, exemplifies the argumentation normally used to support a distinction between ‘lexical’ and ‘syntactic’ processes. As is customary, Kanerva (1987) uses the term *affix* for a subpart of a complex structure created in the Lexicon prior to syntax, while the term *clitic* denotes a syntactic entity which has special properties as regards placement in the string and phonological affiliation. Based on a variety of criteria, Kanerva concludes that Finnish Pxs belong to the affix class. He concludes with a particularly strong statement of the reasons why treating the Pxs as syntactically independent items would be undesirable:

For elements like the Finnish Px’s to be analyzed as clitics, therefore, would gravely weaken linguistic theory. This would force one’s theory to allow word-external elements to interact robustly with word-internal structure, even to the extent of conditioning allomorphy of derivational affixes. Apparently any word-external element could then attach to a word, and for all practical purposes would look like a true part of it. Cutting back this newly unleashed excess of theoretical power would give rise to a crop of unsatisfying stipulations of the very phenomena that deserve clear and revealing explanation. If underlyingly independent items can occur with or on words in surface forms, for example, why is it only those items that interact morphologically with the host word? If phrasal affixes (clitics) occur both at phrase boundaries and on phrasal heads, why does it appear to be only the affixes on phrasal heads that interact deeply with their hosts? (Kanerva 1987:520)

Let us consider Kanerva’s objections in the context of the model advanced here. There appear to be two logical implications in Kanerva’s remarks:

(52) *Some Implications of the Lexicalist Approach*

- a. If an item interacts morphologically with its host word, it occurs ‘with or on’ the host in surface form
- b. Affixes on phrases (i.e. clitics) cannot interact ‘deeply’ with their hosts

Of these two strictures, only (52a) is worthy of attention, since (52b) is empirically false in our view. For example, Miller (1992) provides a detailed study of so-called

‘phrasal affixes’ such as the English possessive *'s*. Such elements are affix-like in phonological behavior, and enter into allomorphy relations with their hosts that are sufficiently ‘deep’ to qualify them in Lexicalist taxonomies as affixal, but have the syntactic distribution of independent syntactic heads, most particularly, they are distributed at the peripheries of particular phrases.<sup>16</sup> To maintain the strict bifurcation of affix vs. clitic while accounting for the mixed behavior of phrasal affixes, Miller does not (as we do) allow phrasal affixes to occur as independent syntactic terminals, but instead elaborates the syntactic component in such a way as to ensure the proper distribution of words which have been affixed by phrasal affixes in the Lexicon prior to syntax. On our theory, such an elaboration of syntax is not required; rather, the operation of Morphological Merger allows syntactically independent phrasal affixes to merge inside their morphological hosts after syntax.<sup>17</sup>

Stricture (52a), however, is an important one and we now consider how our proposal implements it. Consider a scenario which should not be possible, given (52a).

$$(53) \quad (\mu \text{ X [Y] Z } \omega)$$

Suppose the constituent  $\mu$  defines a maximal domain in which elements can condition allomorphy in each other, presumably the MWd; suppose likewise that  $\omega$  is a phonological word, presumably the phonological domain which would qualify Y as being ‘on’ Z in Kanerva’s terms. In (53) Y is morphologically ‘close’ to X but not to Z while at the same time Y is phonologically ‘close’ to Z but not to X.<sup>18</sup>

It should be clear that (52a) results from constraints on the mapping of morphosyntactic structures (which define the constituents  $\mu$ ) to phonological and prosodic categories (which define the constituents  $\omega$ ). The manner in which this mapping takes place is the subject of an abundant literature on the syntax-phonology interface (see Inkelas and Zec 1995).<sup>19</sup> According to the *End- or Edge-based* approach to the syntax-phonology interface (Chen 1987, Selkirk 1986, Hale and Selkirk 1987 and subsequent work), the mapping to phonological categories

<sup>16</sup>For further cases in which syntactically independent terminals interact ‘Lexically’ with their hosts, see Hayes (1990), and the case study of Polish presented in Embick (1995).

<sup>17</sup>We cannot undertake here a complete reanalysis of the cases studied in Miller (1992). Miller carefully discusses a variety of diagnostics which distinguish what are for him true syntactic heads from phrasal affixes, in particular, he considers coordination phenomena in detail. The facts are quite complex, but in our view do not necessarily entail a strict ontological distinction between clitics and affixes.

<sup>18</sup>The precise domains  $\mu$  and  $\omega$  are not defined here: what is important is that the model we espouse contains the means to express the correlation of domains that (52a) demands.

<sup>19</sup>This body of work, mostly Lexicalist in orientation, concentrates on the construction of phonological phrases and larger constituents, rather than on phonological words and their internal structure.



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proceeds through matching the edges of certain syntactic constituents to certain phonological constituents. Since on our theory ‘word-internal’ structures are built from the same formal types as phrasal structures, it follows that a generalized edge-matching grammar should account for the construction of phonological domains of all types, including phonological words.<sup>20</sup>

To prevent the kind of impermissible overlap in structures seen in (53), what is needed is a constraint that requires that any phonological word containing Vocabulary Items from distinct MWds must contain all the Vocabulary Items of those MWds. We can formalize the constraint as follows:

(54) *Phonological Parsing Constraint*

If a phonological word  $\omega$  contains Vocabulary Items inserted into morphemes belonging to distinct MWds, then the edges of  $\omega$  correspond to MWd-edges.

In (53), the left edge of  $\omega$  is not matched with the left edge of some  $\mu$ , so this is not an acceptable pairing between morphosyntactic and phonological structure. Compare the impermissible overlap in (53) with the structures below, which are possible given the Phonological Parsing Constraint:

- (55) a. ( $\omega$  [ $\mu$  X] [ $\mu$  Y])  
b. [ $\mu$  ( $\omega$  X) ( $\omega$  Y)]

In (55a) two MWds are contained in a single Phonological Word. This common situation arises when one MWd is parsed with another, in which case one MWd is a ‘leaner’ in the sense of Zwicky (1985). A leaner, such as the English contracted copula ‘s, attaches ‘promiscuously’ to any string-adjacent host and forms a Phonological Word with it. What is important for our purposes is that a ‘leaner’ constitutes an MWd as a whole, and not part of an MWd. The Phonological Parsing Constraint does not disallow an entire MWd from parsing with another as a phonological word. Inversely, in (55b), a single MWd is divided into two phonological words. Such a situation may arise in cases of compounding that result from head-movement in syntax. The Phonological Parsing Constraint freely allows an MWd to be split into multiple Phonological words, provided that there is no illicit overlap as in (53).

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<sup>20</sup>For work illustrating the complex relationship between morphosyntactic structures and phonological processes, see the detailed analysis of Romance verbal systems in Oltra (1999) and Arregi (1999). McCarthy and Prince (1993) explore some consequences of introducing constraints which match morphological constituent edges with phonological constituent edges, but it is not completely clear whether they intend to eschew a separate Lexicon, as proposed here: their concern is largely with the role such constraints play in determining phonological well-formedness.

In sum, if the Lexicalist distinction between affixes and clitics is real and categorical, then at least two important predictions are made. First, items situated vis-à-vis phrases, yet phonologically dependent on a neighboring word, should typically be leaners in Zwicky's sense. But the existence of phrasal affixes undermines the fundamental distinction which Lexicalism is premised upon and remains an embarrassment to that theory. Second, in the Lexicalist approach, domains relevant for allomorphic influence and phonological categories (particularly the phonological word) should show a direct correlation, inasmuch as both domains are produced by Lexical, as opposed to syntactic, operations. This correlation is an important one, but insofar as it is correct, can be directly modelled within a generalized theory of the construction of phonological categories from the output of Morphology.

## 7.2. Ditropic Clitics in Klavans (1995)

Klavans (1995) proposes a specific theory of clitic types according to which clitics are lexical items with special requirements both for positioning and for phonological affiliation. These requirements are defined by three parameters, *Initial/Final*, *Before/After*, and *Enclitic/Proclitic*, which in turn define 8 predicted types of clitics. The Initial/Final parameter determines whether the clitic is positioned with respect to the left (initial) or the right (final) edge of some syntactic constituent *C*. The Before/After parameter determines the position of the clitic with respect to the peripheral element *X* in *C*, either to the left of *X* (Before) or to the right of *X* (After). The Enclitic/Proclitic parameter determines the phonological affiliation of the clitic: the clitic is incorporated either into the phonological word of the element to its left (Enclitic) or to its right (Proclitic):

### (56) Klavans' Clitic Typology

- |                                       |                       |
|---------------------------------------|-----------------------|
| a. Type 1: Initial, Before, Enclitic  | [ <i>C</i> +cl X ...] |
| b. Type 2: Initial, Before, Proclitic | [ <i>C</i> cl+X ...]  |
| c. Type 3: Initial, After, Enclitic   | [ <i>C</i> X+cl ...]  |
| d. Type 4: Initial, After, Proclitic  | [ <i>C</i> X cl+ ...] |
| e. Type 5: Final, Before, Enclitic    | ...+cl X <i>C</i> ]   |
| f. Type 6: Final, Before, Proclitic   | ...cl+X <i>C</i> ]    |
| g. Type 7: Final, After, Enclitic     | ...X+cl <i>C</i> ]    |
| h. Type 8: Final, After, Proclitic    | ...X cl+ <i>C</i> ]   |

Of the eight possibilities, types 2, 3, 6 and 7 receive a natural interpretation within the model advocated here. In each such case, the peripheral element *X* in *C* is *both* the phonological and the structural host of the clitic. As Marantz (1988) shows, types 2 and 7 require either string-vacuous Merger of some

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type, or are simply ‘leaners’ derived through a mismatch between morphosyntactic constituency and phonological constituency, as described in section 7.1.1. Types 3 (such as Latin *-que*) and 6 (such as Huave *-ay*) result from Local Dislocation inverting the clitic and *X*, but aside from this correspond to types 2 and 7 respectively.

Types 1, 4, 5 and 8 are not well attested, and all of these share the property that their phonological host is distinct from their structural host within our assumptions. For example, in type 4, the clitic must be positioned after *X* through Morphological Merger from an underlying position at the periphery of *C*:

$$(57) \quad [{}_C \text{ cl} * [X * Z \dots \rightarrow [{}_C [X+\text{cl} * Z \dots \rightarrow X [{}_\omega \text{ cl}+ Z]$$

But because a type 4 clitic is proclitic, it must also be parsed into the phonological domain of *Z*. Hence the clitic’s structural host is *X* while its phonological host is *Z*. Because such clitics are attracted one way structurally and a different way phonologically, we will refer to them as *ditropic* clitics. Types 1, 4, 5 and 8 of Klavans’ typology are all ditropic in this sense.

In view of the Phonological Parsing Constraint introduced above, it turns out that ditropism is in fact impossible on our theory. To see this, consider again (53), repeated below:

$$(58) \quad (\mu X [Y] Z {}_\omega]$$

Recall that this mapping between morphosyntactic constituents  $\mu$  and phonological constituents  $\omega$  is prohibited by the Phonological Parsing Constraint (54). *Y* in (58) schematizes the expected behavior of a Type 4 clitic: it has *X* as its structural host, so *X* and *Y* are in the same  $\mu$ -domain, but it has *Z* as its phonological host, so *Y* and *Z* are in the same  $\omega$ -domain. If such mappings are prohibited, then ditropism is likewise prohibited.

Previous analysts have not failed to notice that among the various clitic types proposed by Klavans, some are better-exemplified than others (Sadock 1991, Spencer 1991:378, Marantz 1988), but there is in fact some disagreement as to which types are legitimate.<sup>21</sup>

<sup>21</sup>In particular, Sadock (1991) disallows Klavans’ types 4, 6 and 8 and notes that each such case involves procliticization, which he views as cross-linguistically disesteemed. The model proposed here however permits type 6 in principle. The rarity of such a clitic type probably has an independent explanation, at least for clitics which are MWds (Huave *-ay* is plausibly a Subword example of type 6). A type 6 clitic is placed at the right edge of some constituent *C*, but then must undergo Morphological Merger to invert with the final element *X* in that constituent:

$$(i) \quad \textit{Type 6 clitic} \\ \dots X \text{ cl } {}_C] \rightarrow \dots \text{cl}+X {}_C]$$

Our proposal prohibits true ditropic clitics while admitting the other four possibilities. In the following sections we consider examples cited in the literature of ditropic clitics, showing that none truly require an analysis contravening the Phonological Parsing Constraint (54). Insofar as this result is predicted by our assumptions, we find direct evidence in favor of our approach over competing alternatives.

### 7.2.1. Type 1 and Type 8 Clitics

Consider first types 1 and 8.

(59) Peripheral Ditropic Clitics

- a. Type 1: Initial, Before, Enclitic [<sub>C</sub> +cl X ...
- b. Type 8: Final, After, Proclitic ... X cl+ <sub>C</sub>]

The much-discussed case of Kwakwala clitics from Anderson (1984) is typically used to exemplify Type 1.

- (60) la-i        aχʔed-**ida** tsʔədaqa-**χ-a**    ʔluʔəlqʷʔi  
 AUX-PRO takes-the woman-OBJ-the dishes  
 ‘The woman takes the dishes.’

As the above example (taken from Sadock 1991) shows, determiners in Kwakwala may be internally complex, consisting of a case-expressing morpheme followed by an article, e.g. *χ-a* ‘OBJ-the’. We assume that the case-expressing morpheme is dissociated, and left-adjoined in Morphology to D. These complex determiners precede their argument nouns in Kwakwala, but phonologically parse as enclitics on a preceding word.

While this example quite clearly shows the effects of phonological ‘re-bracketing,’ the case-marker+determiner element does not qualify as truly ditropic in our terms. Rather, there is no reason to construe the string position of the Kwakwala D as requiring a ‘structural host.’ Rather, D in Kwakwala is an MWd which precedes the noun because this is the syntactic position in which D is generated, as in many languages. In (60) D does not require Morphological Merger to arrive at

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For the clitic to be situated syntactically at the right edge of a constituent in the first place, the language in question should be head-final in syntax. Because head-final languages are normally preferentially suffixing languages as well, it would be unexpected to find an element which upon undergoing Local Dislocation would *left*-adjoin rather than *right*-adjoin to its host. Hence, we agree with Sadock that the paucity of Type 6 cases results from a general dispreference for procliticization, particularly in syntactically head-final languages, but we do not elevate this tendency to a formal constraint of the grammar.

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its proper string position. Consequently, the Kwakwala D is simply a left-leaner, and not a ditropic clitic.

More generally, *for an element to qualify as ditropic in our terms, it must itself be a Subword*, having undergone Local Dislocation to adjoin to its structural host (or having been adjoined in Morphology directly on a head). Where a syntactic terminal is *in situ* or arrives at its location by Lowering, it forms an MWd on its own and thus has no ‘structural host’. Such elements cannot then be ditropic in the relevant sense.

No plausible examples of ditropic Type 8 clitics are known to us. Klavans (1995) argues that classical Greek *ou* ‘not’ requires these parameter settings, but we agree here with Sadock (1991) that the Greek case has been misanalyzed and we will not review it here.

In sum, plausible cases of Type 1 and Type 8 clitics are either MWds themselves with phonological ‘leaning’ properties or else have been misanalyzed.

### 7.2.2. Type 4 Clitics

There is general agreement among researchers that type 4 clitics are quite *récherché*. For this case, Klavans (1985) points to the subject clitic pronouns of Tepecano (Uto-Aztecan), drawing from the work of Steele (1977). It should be noted from the outset that because Tepecano is no longer spoken, the Tepecano data are taken exclusively from an early grammar (Mason 1916) and are far from completely reliable.

Steele (1977) compares the behavior of clitics in the Uto-Aztecan languages and argues that historically, the verbal agreement prefixes of Huichol, Classical Aztec and Pochutla arose through a reanalysis of second-position clitic pronouns as agreement prefixes.

(61) Subj+cl V Obj > Subj cl+V Obj

Tepecano is alleged to represent a case intermediate between the two stages in (61); here the clitic is said to ‘fill both positions simultaneously’:

(62) ndedos n-an-ahohoinda  
my.fingers introducer-1sg.clitic-will.shake.them  
‘I will shake my fingers’ (Steele 1977:543 citing Mason 1916:403)

However, the data provided by Mason (1916) in no way establish that the Tepecano subject clitics actually instantiate Type 4, as Klavans seems to have concluded. While it is true that in the above example the 1st person singular subject clitic *an* is situated immediately before the verb stem and also occurs after the first word of the clause, there is not in general any requirement for subject

clitics to appear in second position in the clause. The following examples taken from Mason’s texts show sentence-initial clitics, even in clauses which contain more than one word:

- (63) a. **a-** vic- nagiu- kat hooviit- aʔbba  
 3sg.clitic- positive- hang.intrans- continued.past.state zapote- in  
 ‘He (fox) was in a zapote tree . . .’
- b. **n-** ic- töʔtN- it höga tödoʔ tövwaG  
 1sg.clitic- positive- uphold- APPL that blue heaven  
 ‘I am holding up the blue heaven’ (Mason 1916:379–80)

From these examples, we can conclude that the subject pronominal clitics are not required to be in second position in Tepecano, although where the verb happens to be the second word in the clause, as in (62), they may occur there by sheer coincidence.

Inversely, we do not find any examples in which the subject clitic is not proclitic on the verb, as might be expected if it were required to be in clausal second position. As Mason states (p. 336), “[t]he essential elements of the verbal complex are the pronominal subject and the verb stem. The former always stands at or near the beginning of the complex.” The only elements within the verb complex that may precede the subject clitics are certain conjunction- or complementizer-like proclitics, including *n-* ‘relative’ (which Steele glosses as ‘introducer’ in (62)), *ku-* ‘subordinate’, and *naaku-* ‘potential’ (Mason 1916:338). But as the examples in (63) show, these proclitics are not obligatory (although in texts we have access to they are quite common).

In sum, there is no direct evidence that Tepecano subject clitics were obligatorily placed in sentential second position. From the limited materials available on the language, it appears that in Tepecano subject clitics are in fact always proclitic on the verb word. Returning to Steele’s proposed diachronic scenario (61), we do not dispute that second position clitics in Uto-Aztecan may have been reanalyzed as verbal proclitics, but from this we are not obligated to conclude that there ever existed a stage with a Type 4 clitic, as Klavans concluded. On the contrary, besides being unattested in any known Uto-Aztecan language, such an intermediate stage would introduce an otherwise unprecedented grammatical construction.

### 7.2.3. Type 5 Clitics

Finally, we consider type 5 clitics, the only remaining clitic type which might qualify as ditropic. Two examples are known to us from the literature: pronominal clitics in Kugu Nganhcara (Smith and Johnson 1985, Klavans 1995), and

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Northern Mansi conditional *-ke* (Nevins 1988). In this section we consider the Kugu Nganhcara case, delaying a detailed discussion the Mansi case to section 8.

*Kugu Nganchara* is an artificial name used among linguists for a set of related dialects (Uwanh, Ugbanh, Yi'anh, Muminh, Mu'inh and Iyanh) spoken in North Queensland, Australia. All data here are taken from Smith and Johnson (1985), who argue that the clitic pronouns of this language exemplify Klavans' type 5 clitic. In the sentences provided, the verb is in absolute final position in the clause, preceded by other arguments whose string order is said to be freely permutable. Clitics referencing subject, object, dative and ablative arguments are normally situated immediately before the clause-final verb, but are phonologically enclitic on the preceding word:

- (64) a. nganhca    nga'a **-nhca**    yenta  
we.excl.NOM fish   -1.excl.pl spear  
'We speared the fish'
- b. nhila nganyi    yupa **-nyi**    yenta  
he    me-ACC FUT -1sg.ACC spear  
'He will spear me.'
- c. nhila    pama-ng    ngathu ku'a **-thu**    waa  
he-NOM man-ERG I-DAT dog -1sg.DAT give  
'The man gave me a dog.'
- d. ngaya    ku'a nhingkurum ka'im **-ngkurum** kala-ng  
I-NOM dog you.sg-ABL NEG -2sg.ABL take-1sg  
'I didn't take your dog.'

Smith & Johnson (1985:105) assert: 'As a result of the relatively free constituent order in Nganhcara, any constituent may occur in pre-verbal position and thus serve as a host for cross-referencing pronouns.' Hence, any attempt at construing the phonological host of the clitic as its structural host is doomed; they conclude that the immediately preverbal position of the clitics shows that the verb is (in our terms) the structural host. If so, then Nganhcara provides an example of ditropic clitics contravening our proposed Phonological Parsing Constraint (54).

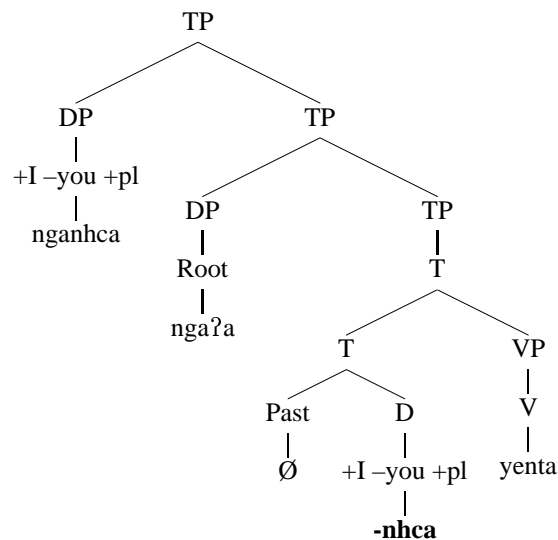
However, Smith & Johnson themselves point to a potential analysis of the facts which we pursue here. They continue:

The closest approximation to the Nganhcara situation is made by Walmathari (Hudson 1978) where it appears that the auxiliary and the clitic pronouns together make up a free form in pre-verbal position, which may, under certain rhythmic conditions, cliticize onto the previous word. There are other Australian languages in which clitic pronouns may cliticize onto any type of constituent, but in all cases

these pronouns are enclitics on the first word of the clause (Blake 1977). (Smith & Johnson 1985:105)

Recall from the discussion of Kwakwala in section 7.2.1 that for an element to qualify as ditropic in our sense and thus contravene the Phonological Parsing Constraint, it must be a Subword which has a ‘structural host’ to begin with. Smith & Johnson’s remarks suggest an alternative analysis whereby the clitic cluster in Nghanhcara instantiates an auxiliary which is *in situ* directly before the verb. The relatively free string-order of the remaining constituents suggests that these are adjoined to the clause as a whole, as proposed by Jelinek (1984). Example (64a) above will thus receive the analysis below:

(65) Nghanhcara Clause



We analyze the clitic pronouns as being adjoined to T.<sup>22</sup> In some cases, such as (65), T can be phonologically null, but need not be, as shown by examples such as (64b), where the overt signal *yupa* is inserted in a T bearing future features. Smith and Johnson (1985) report the existence of several other elements which occupy the position we identify as T, including *-dhu* ‘may’, *-li* ‘then’, and *-m(a)* ‘emphatic’; the pronominal clitics always follow these items if present, which are also enclitic on the preceding word phonologically. It is clear that all these

<sup>22</sup>Whether they are generated as Agr adjuncts to T in Morphology or are determiners which arrive at T during syntax remains unclear to us but does not bear on the general point: in either case the whole complex is a single MWd.



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elements contain properties which are plausibly attributed to a Tense projection or to similarly situated modal projections of various types.

If our analysis of the facts is correct, then Nghanhcara pronominal clitics are rather unsurprising in their behavior. They adjoin to T or to some other functional projection higher than VP and thus are situated *in situ* to the left of the verb. Phonologically the T+clitics complex cannot stand alone (unless T is instantiated by a free-standing allomorph such as *yupa* 'future' as opposed to its enclitic variant *-pa*). At PF then the T complex leans leftward much like the Kwakwala Determiner.

In this way, Nghanhcara presents a mirror-image of Warlpiri (Hale 1973). As Hale shows, the Auxiliary constituent in Warlpiri is situated in second position in the clause whenever it consists of two syllables or fewer (66a), but in other instances occurs clause-initially (66b):

- (66) a. wawiri **ka-rna** pura-mi  
kangaroo PRES-I cook-NONPAST  
'I am cooking the kangaroo'
- b. **kapi-rna** wawiri pura-mi  
FUT-I kangaroo cook-NONPAST  
'I will cook the kangaroo'

In our terms, the inversion seen in (66a) must be a Local Dislocation, since it is sensitive to phonological properties of the Vocabulary, and therefore will occur only concomitant with Vocabulary Insertion and not before. But the important observation here is that like Nghanhcara, while the AUX stem in Warlpiri can be phonologically overt (*ka* 'present' in (66a) and *kapi* 'future' in (66b)), it need not be:

- (67) a. wawiri **-Ø-rna** pura-tja  
kangaroo AUX-I cook-PAST  
'I cooked the kangaroo'
- b. **kula-Ø-rna** wawiri pura-tja  
NEG-AUX-I kangaroo cook-PAST  
'I did not cook the kangaroo.'

Where AUX is phonologically null, the clitic pronouns which attach to it structurally are enclitic either on the preceding MWd (67a) or to NEG, which we interpret as left-adjoined to AUX (67b). In this respect, Warlpiri Aux behaves exactly like the preverbal clitic complex in Nghanhcara.<sup>23</sup>

<sup>23</sup>Smith and Johnson (1985) also state that the clitic pronoun cluster may follow the verb, rather than precede it; hence the following two examples are alternatives:

In sum, the distribution of clitic pronouns in Nghanhcara does not require an analysis that treats them as ditropic. Rather, the clitic pronouns are adjoined to a (possibly phonologically null) functional projection such as T whose *in situ* position is immediately before the clause-final verb. The entire T+clitic complex forms an MWd which if necessary parses with the preceding MWd during the construction of phonological words.

### 7.3. Summary

To review, we have disputed the distinction between clitics and affixes which is demanded by all theories which adopt the Lexicalist hypothesis in its strict form. Of the correlations which Lexicalism sought to explain, we argued that the only one which appears to be empirically correct is that there appears to be a correlation between the domain in which two items can exert allomorphic influence on each other and the domain of (approximately) the phonological word. We proposed that this correlation falls out from a several distinct aspects of our model of grammar. First, we proposed a Phonological Parsing Constraint, a species of the set of constraints which defines the mapping from morphosyntactic structure to phonological constituency, long recognized to require a grammar of its own for phrasal domains (Inkelas and Zec 1995). Second, this constraint when coupled

- 
- (i) a. nhinta           putu uwa-n-**li-nta**  
       you.sg.NOM away go-2.sg-then-2.sg  
       ‘Did you go away then?’
- b. nhinta           putu-**li-nta**     uwa-n  
       you.sg.NOM away-then-2.sg go-2.sg  
       ‘Did you go away then?’

We analyze such cases of post-verbal clitics as involving optional raising of V to left-adjoin to T, so that the entire clitic complex will follow the inflected verb. However, Smith and Johnson (1985) also indicate that the clitic cluster can be separated so that one pronominal clitic can appear in pre-verbal position while another is enclitic on the verb:

- (ii) pupi-**nh**           mama-**la**  
       firestick-3.sg.ACC hold-3.sg.NOM  
       ‘He held the firesticks’

Admittedly, such cases are unexpected given the V-to-T raising analysis of post-verbal clitics. In the absence of more examples of this phenomenon, we speculate that such cases may involve movement (or insertion in Morphology) of one clitic to T and another to V. Smith and Johnson (1985) do not provide examples where an overt tense/modal clitic appears post-verbally while a pronominal clitic appears pre-verbally. We predict that such cases should be strictly impossible, since pronominal clitics can be positioned preverbally only by raising to T when the verb has not also raised to T. We leave these cases open to further study.

with the natural restriction that MWds are islands for Local Dislocation of Subwords (6.3.2), ensure that a Subword will remain within the phonological word projected by the MWd it is contained in, and can never ‘move’ to another phonological host at PF. The islandhood of MWds calls into question the possibility of what we termed ‘ditropic’ clitics, clitics whose phonological host is distinct from their structural host. These correspond to types 1, 4, 5 and 8 of the clitic types in Klavans (1985, 1995). We showed that all known cases of such clitic types do not in fact qualify as ditropic in our sense, since all of them have either been misanalyzed or are MWds themselves lacking any structural host in our terms.

### 8. Mansi Complementizers

The last remaining case known to us of a potentially ditropic clitic comes from Mansi, a Finno-Ugric language related to Hungarian and spoken in Western Siberia. Nevis (1988) drew attention to the conditional suffix *-ke* in Mansi and first proposed that it instantiates Klavans’ Type 5 clitic.

The conditional suffix *-ke* ( $\sim$  *-íe*  $\sim$  *-íi*) ‘if’, originally borrowed from Komi probably sometime between the 10th and 15th centuries AD (Rédei 1970), varies in its placement depending on the dialect of Mansi. We confine our attention to the northern or standard (Sygyva) dialect, which shows an unusual pattern of distribution for *-ke*. Nevis (1988:353) analyzes it as a second-position (penultimate) clitic which ‘selects the verb of the conditional clause as its host’ but which prosodifies with the immediately preceding word. As the following examples show, *-ke* can be attached to any preceding word, such as direct object, Negation, PP, adverb, or infinitive:

- (68) a. nomt-**íi** ońś-ēy-ən  
 thought-if have-PRES-2pl  
 ‘if you understand (lit. have thought) ... ’ (Kálmán 1976:98)
- b. at-**ke** wāy- l-ən am lāw-ēy-um  
 Neg-if know-3sg.obj-2pl I tell-PRES-1sg  
 ‘If you don’t know it, I (will) tell you.’ (Kálmán 1965:45)  
 to PP
- c. tí kol-n-**íe** joxtıf-ew  
 that house-LOC-if enter-1pl  
 ‘if we enter the house ... ’ (Kálmán 1976:90)
- d. loŋxála-**íe** jōmantíe-men  
 downstream-if stroll-1du  
 ‘If we (two) stroll downstream ... ’ (Kálmán 1976:85)  
 infinitive

- e. akw-tít χōtal ōl-uŋkw-**te** lāw-we-s-amēn  
 one-two day live-INF-if order-PASS-PAST-1dual  
 ‘If we were given (lit. ordered) one (or) two days to live ... ’  
 (Kálmán 1976:50)

Prosodic considerations alone cannot account for the suffix’s distribution, Nevis argues, since if *-ke* merely requires a prosodic host to its left, it could equally well be a suffix to its (putative) structural host, the inflected verb:

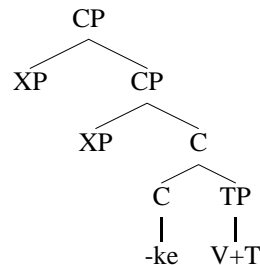
- (69) [ ... V+T-*ke* ]

Instead, Nevis argues that syntactically *-ke* is a left-sister to the (inflected) verb, but prosodically is parsed as a suffix with the preceding phonological word. If correct, this analysis requires that *-ke* be treated as a truly ditropic clitic.

On our account, such behavior is impossible. In order for *-ke* to be placed in the second-to-last position, i.e. immediately before the inflected verb, it would have to undergo some variety of Morphological Merger, either Lowering or Local Dislocation, adjoining to the inflected verb (V+T), and forming a complex head with V+T. Thus *-ke* would signalize a Subword. A phonological parse in which *-ke* would vacate its MWd of origin for the phonological word formed by the preceding MWd should be prohibited.

There are, however, fairly good reasons to doubt an account in which *-ke* finds its string position by a Merger operation. In the following section, we argue that *-ke* instantiates the Complementizer node in Mansi and is in fact *in situ*. Following recent proposals for the syntax of Hungarian, a related language, we propose that material preceding *-ke* in the clause occupies one or more specifier positions higher than C. Specifically, we will argue for the following phrase structure:

- (70) In Situ analysis for *-ke*



To establish this result we first review some essential facts about Mansi syntax.

### 8.1. Mansi clause structure

Northern Mansi is a (mostly) head-final language with a basic SOV order; in neutrally ordered sentences an inflected verb nearly always appears in clause-final position (Rombandeeva 1984):

- (71) mēn sāw χūlp ūnt-əs-men  
 we many fishnet throw-past-1du  
 ‘We threw out many fish nets’ (Kálmán 1976:146)

We analyze the clause-final position of the inflected verb as evidence that the verb raises to T, which is normally at the right-periphery of the clause.

An inflected V appears to the right of negation (*āt* ~ *āí(m)*); Negation in turn follows other arguments in the clause (72).

- (72) sūl’i-pūt pālēt sip kóťal’-n **at** joχti  
 clay.pot half hill middle-LOC NEG go  
 ‘Her half of a clay pot did not reach the middle of the hill’ (Kálmán 1976:66)

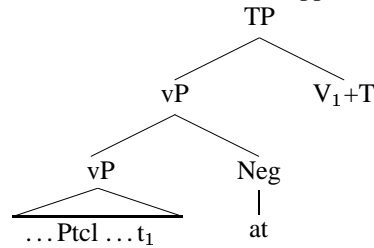
The fact that the verb raises to T across the negation marker shows that this marker is not a head (Neg<sup>o</sup>); we assume instead that it is an adverbial element right-adjoined to vP.

The base position of a verb is further diagnosed by separable prefixes. Specifically, a verb can leave behind an adverbial prefix such as *χot* ‘out’ or *nō(ŋ)χ* ‘up’, which appears to the left of negation in an inflected clause (73), but immediately precedes a finite verb in a clause without negation or a complement infinitive (74) (Kálmán 1965, Murphy 1977).

- (73) a. sōrńiŋ śērmāt **χot at** wi-s-te  
 golden saddle away NEG take-past-sg.obj-3sg  
 ‘He did not take the golden saddle away’ (Murphy 1977: 223)  
 b. wāssiŋ **nōχ at** lāpi  
 anymore up NEG rise  
 ‘It (cannot) rise up any more’ (Murphy 1977:224)
- (74) a. janiŋ māχm-an-uw **χot-fēnatasət**  
 big people-pl-1pl out-grumbled  
 ‘Our parents grumbled (that ... )’ (Kálmán 1976:50)  
 b. taw **nōŋχ-χul’iŋl-aŋkwe** pati  
 he out-emerge-INF begin  
 ‘he is beginning to emerge (up)’ (Kálmán 1964:57–58)

We assume that in finite clauses the separable adverbial prefix remains *in situ* in the vP, while V moves to adjoin T. Given these facts, a reasonable first approximation for Mansi clause-structure appears in (75).

(75) Mansi Clause Structure (First Approximation)



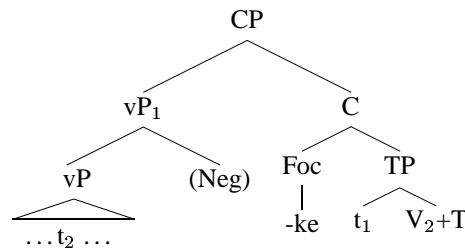
Given this structure, the position of *-ke* is quite unexpected, since the most plausible category for it would be C. We might, for example, construe the pre-verbal position for *-ke* as arising from a Local Dislocation of a clause-final C to a position immediately to the left of the verb:

$$(76) \quad [ \dots V+T ] * -ke \rightarrow [ \dots -ke+V+T ]$$

In such a case, however, it would be unexpected for *-ke* to subsequently join phonologically with the preceding MWd. For *-ke* to be able to ‘lean’ phonologically on its left neighbor, it should constitute an MWd by itself, and to do this, it should not have undergone any syntactic or morphological movement.

Suppose then that *-ke* does indeed instantiate an *in situ* complementizer. To obtain the constituent ordering we have so far reviewed, we hypothesize that the vP raises to Spec,CP position as shown below:

(77) Mansi Clause Structure (Revised)



Negation, a right-adjunct to vP, also raises with vP, yielding the observed constituent order. This type of analysis, in which a lower verbal projection is raised to a higher position in the clause as a phrase, is directly related to the ‘predicate fronting’ type of approach that has been proposed for languages like Malagasy;

see in particular Rackowski (1998), for the fronting of predicates along with adjoined material in an analysis of Malagasy.<sup>24</sup>

In the following sections we present evidence in support of this revised structure by examining first, the syntax of subordinate clauses in general, and second, sentences (undiscussed by Nevis) in which *-ke* does not appear in the preverbal position.

## 8.2. Subordination structures

Subordination in Finno-Ugric languages was originally expressed either by gerunds or participles or through parataxis, that is, by clauses conjoined without a subordinating conjunction (Tauli 1966, Comrie 1981), and these devices are still commonly employed in Mansi (Romandeeva 1984:140-149). Nevertheless, there do exist subordinate clauses with overt subordinating conjunctions of various types. These appear to fall into two categories. The conjunction *(w)os*, used to introduce hortative and purposive clauses, has the same distribution as *-ke*, but unlike *-ke* does not ‘lean’ phonologically on the preceding word. Other subordinating elements appear to be essentially adverbials, which are either adjoined to the vP or are fronted to sentence-initial position. These two types of subordinators and their ramifications for the analysis of *-ke* are discussed in the following sections.

### 8.2.1. Hortatory and Purposive *(w)os*

The particle *(w)os*, used in purposive and hortatory clauses, also appears between Negation and the inflected verb (Murphy 1977: 229), which is again separated from any adverbial prefix. In such clauses Negation has the allomorph *ul* instead of *(āt ~ āī(m))*. In the following examples, we gloss *(w)os* simply as ‘that’.

#### (78) Purposive clauses

- a. ta porat χumi-t-ən lapl’ūl’awe, ēkwa-t **ul os** suns-ēy-t  
 that time man-pl-with covered woman-pl NEG that see-pres-3pl  
 ‘At this time he is hidden (covered) by men so that women may not see him’

<sup>24</sup>One point which arises in connection with this treatment of Mansi syntax concerns the status of the subject; in particular, whether it moves independently of the fronted vP in which it originates. As we have no clear evidence on this point, we will not be addressing it in detail.

- b. tuwl siraj-sis-əl      ūsliḡta-s-aḡ-e      **jol os min-ēḡ**  
 then sword-back-INST menace-past-du.obj-3sg under that go-pres  
**nōḡḡ ul os pājalt-ēḡ**  
 up not that rise-pres  
 ‘Then he menaced them with the back of his sword, so that they go down, so that they do not rise up.’ (Murphy 1977: 229)

(79) Hortatory clauses

- a. ji-ḡkwe **ul** **wos wērm-eḡ-t**  
 come-INF NEG that be.able-pres-3pl  
 ‘Let them not be able to come’
- b. ti kol-um-t      **ul os ōli**  
 this house-1sg-LOC NEG that be-3sg  
 ‘Let her not be in this house of mine’ (Murphy 1977: 229)

Similar examples are provided in Rombandeeva (1984: 155). We analyze (*w*)*os* just like *-ke*: both are *in situ* complementizers.

**8.2.2. Adverbial subordinators**

Although (*w*)*os* occurs in the same preverbal position as does *-ke*, other so-called ‘subordinating conjunctions’ such as *ḡuñ* ‘when’ and *ḡumus* ‘how’, *manriḡ* ‘why’ and *ḡōt* ‘where’ have the same distribution as adverbials or wh-adjuncts. These elements have two potential positions (some occur in both positions, while others seem to prefer one or the other). The first position is before negation and the verb, but following other arguments of the clause.

- (80) kon **ḡuñ** kwāli  
 out when go  
 ‘When he goes out . . . ’ (Kálmán 1965: 58)
- (81) taw tiḡəl      ojiḡp-ḡkwe **ḡumus** worāt-as  
 he from.here escape-INF how strive-past  
 ‘How did he try to escape from here?’ (Rombandeeva 1984:64)

This position is a typical one for adverbs:

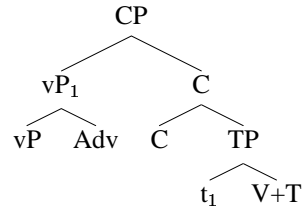
- (82) nājəḡ-xap lōḡḡ-e      **ñēr-əl**      **pājtaxt-im** ḡūl’ī-te  
 fire-boat path-3sg foam-INST cook-GER leave-3sg.obj  
 ‘The steamship leaves its path (behind itself) foaming (lit. cooking with foam)’ (Rombandeeva 1984:59).



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We construe these as right-adjuncts to vP, which, like Neg, raise with vP to the left of the complementizer position:

- (83) Adverb adjoined to vP

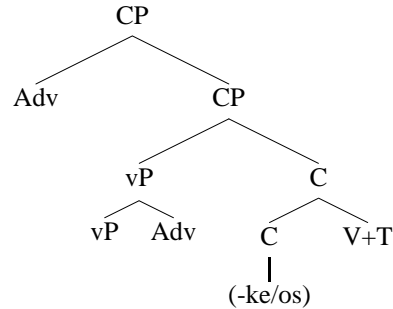


Alternatively, these elements may occur sentence-initially, either when acting as subordinators or in matrix questions:

- (84) a. **χ<sub>u</sub>n** am juw-śaltsum, omam noχ-kwalum ...  
 when I home-went, mother-my up-got-PastPpl  
 ‘When I went home my mother was already up ...’ (Tauli 1966:95 citing Balandin & Vachrusheva 1957)
- b. **χ<sub>u</sub>n** oln-anəl lākkwa-urt-s-anəl, piyriś śān-e  
 when money-their themselves-divide-past-them, boy mother-his  
 palt joχt-əs  
 to come-past  
 ‘When they had divided the money among themselves, the boy came to his mother’ (Romandeeva 1984:152)
- (85) a. **χ<sub>u</sub>mus** taw tiyəl ojiyp-əjkwe worāt-as  
 how he from.here escape-INF strive-past  
 ‘How did he try to escape from here?’ (Romandeeva 1984:64)
- b. tōwa porat mān χūntl-ēw, **χ<sub>u</sub>mus** wōstuχ pal-as-t śiwgi  
 one time we listen-1pl how wind ear-hole-LOC whistle.3sg  
 ‘At times we listen how the air (wind) whistles in our ears.’  
 (Romandeeva 1984:151)
- (86) **χ<sub>o</sub>t** piťi ōli, χ<sub>o</sub>təl nāŋi  
 where nest is, whence be.visible  
 ‘Where is the nest, from where (is it) visible?’ (Romandeeva 1984:64)

We construe these clause-initial conjunctions not as instances of C but rather as adverbials which have A'-moved to Spec,CP. As such, they can occur to the left of the raised vP, and hence clause-initially:

(87) Two Positions for Subordinating Conjunctions



The behavior of argument *wh*-expressions confirms that these may be either *in situ* or raised to Spec,CP:

(88) In situ

- a. towləŋ ūj-ət      χōtal palit    **mānər** wār-ēγ-ət  
 winged animal-PL day during what make-PRES-3pl  
 ‘What do the birds make during the day?’ (Romandeeva 1984:63)
- b. taw **xottut** l’ōŋ-anəl ālpəl wā-s-an-e  
 he who trail-3pl early see-PAST-3pl.obj-3sg  
 ‘Whose trails did he see in the morning?’ (Romandeeva 1984:63)

(89) Raised to Spec,CP

lāwēn, **man-xurip pīl-ət**    nān    wāγ-ēn  
 say-2pl what-like berry-PL you.pl see-2pl

‘Say, what kind of berries do you (pl.) see?’ (Romandeeva 1984:63)

In sum, the distribution of *-ke* is exactly like that of another subordinator, (*w*)*os*, used in hortatory or purposive clauses. Other subordinate clauses are expressed without overt complementizers, but can contain adverbial *wh*-expressions. These, like argumental *wh*-expressions, can appear in both matrix and subordinate clauses either in within the *vP* (and hence, before an inflected verb), or can be raised to Spec,CP. Since *-ke* does not have this distribution, we conclude that it is neither in Spec,CP nor an adjunct in general, but rather a zero-level category, namely C itself.

**8.3. Other positions for *-ke***

So far we have restricted our attention to sentences in which *-ke* occurs in what we will call its ‘canonical’ position immediately before the inflected verb, following negation, if present. We have proposed that this is in fact the *in situ* position of C

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in Mansi, and that the string order observed in such clauses arises through raising of vP to Spec,CP, along with raising of V to a clause-final T.

However, the distribution of *-ke* is subject to some variation. According to Rombandeeva (1984: 152–53), herself a native speaker of Northern Mansi, the typical position for *-ke* is pre-verbal or, alternatively, *-ke* may be attached to the inflected verb itself. Riese (1984), in a study of conditional clauses in Uralic generally, examined the distribution of *-ke* in a large corpus of Mansi texts. He concluded that *-ke* may have three different clause positions. In 67% of clauses examined, *-ke* was suffixed to the word immediately preceding the inflected verb (90), to the right of negation (91), if present, i.e. in the canonical position. In 12% of cases, the clause contained only a single (prosodic) word; in such case it is suggested that the requirement that *-ke* appear as a suffix necessitates a clause-final position for *-ke* (92).

- (90) l'ēw ēlmχolas-nəl-**ke** pili ...  
lion man-from-if fear

'If a lion fears a man ...' (Kálmán 1976:140)

- (91) not palit **at-ke** tinalax̄tsmēn ...  
lifetime through NEG-if do.business

'If we had not conducted business all of (our) lives ...' (Riese 1984:79 citing Kannisto I:235)

- (92) ērəptaste-ke  
love-if

'If he had loved (me) ...' (Kálmán 1976:126)

Assuming some sort of prosodic explanation (such as Prosodic Inversion) for the position of *-ke* in (92), the examples above require no further comment and can be accommodated within a variety of analyses, including Nevis' and ours. However, Riese found that *-ke* can occur in two other positions: it can occur clause-finally even in clauses containing more than one word, or it can occur attached to a constituent somewhere to the left of the canonical position. In the following sections we show that these exceptional examples actually confirm the hypothesis that *-ke* instantiates C.

### 8.3.1. Final *-ke*

In 14% of clauses examined by Riese, *-ke* appears instead as a suffix to the inflected verb (93a), even when there exists a preceding phonological word which could host *-ke*:

- (93) a. lawχatneporate ēlipalt aji-**ke** ...  
 promised.time before drink-if  
 ‘If he drinks before his promised time ... ’ (Riese 1984:69 citing Kannisto III:12)
- b. nājəŋ-χap roŋχaltaχtī-**ke** ...  
 fire-boat honks-if  
 ‘If the steamship honks ... ’ (Romandeeva 1984:153)

Such cases of ‘final *-ke*’ cannot be explained by requiring a Prosodic Inversion of *-ke* and the verb, since there would be no motivation for such an inversion. Rather either V+T must move to *-ke* or vice versa. If, as on our analysis, *-ke* instantiates C, then the order V+T+C can arise simply by raising of V+T to C, much as in Conditional Inversion in English.

- (94) [<sub>CP</sub> vP<sub>1</sub> [ V+T+C [ t<sub>1</sub> ] ]]

The precise reasons for such exceptional raising are unclear, but may be stylistic in nature. Nevertheless, it is obvious that such a derivation is not at all unprecedented.

### 8.3.2. Anomalous *-ke*

In addition, in a final 7% of cases, *-ke* appears in some other position not predicted by Romandeeva’s generalization (95):<sup>25</sup>

- (95) a. naŋ-**te** sārtn-sisi ŋowəmtēχən ...  
 you-if first move-2sg  
 ‘If you move as the first one (i.e. are the first to move) ... ’ (Kálmán 1976:50)
- b. am-**ke** sārt tāyinti  
 mine-if first falls-3sg  
 ‘If mine falls first ... ’ (Riese 1984:70 citing Kannisto I: 205)

<sup>25</sup>Although both examples in (95) contain the adverb *sārt* ‘first’ the following example shows that *-ke* need not occur to the left of *sārt*:

- (i) naŋ tānluwn **sārta-ke** tāyinti ...  
 you sinew-bone first-if falls  
 ‘If your sinew-string bone falls first ... ’ (Riese 1984:72 citing Kannisto I: 205)

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We will refer to such cases as ‘anomalous *-ke*.’ Riese (1984: 70) surmises that in such cases “emphasis plays a major role in positioning of the particle” and we concur with this view. Specifically, *-ke* in these cases is phonologically attached to a constituent which appears to be a contrastive topic argument located at the very left periphery of the clause.

In this respect, Mansi resembles Hungarian, where arguments under contrastive emphasis can appear in a ‘left-dislocated’ position (Kiss 1984:80–83, Kenesei, Vago & Fenyvesi 1998:172–74):<sup>26</sup>

(96) Hungarian Left-Dislocation

**Ebéd-et** János főzött, **vacsorá-t** pedig Mari.  
lunch-ACC John cooked supper-ACC on-the-other hand Mary

‘Lunch, John cooked it, whereas supper, Mary (cooked it).’

Similar phenomena appear to play a significant role in Mansi syntax as well.<sup>27</sup> For example, although the normal constituent order is SOV, Kálmán (1965) notes that an object argument may appear to the left of the subject (97).

- (97) a. sun lūw χarti  
sledge horse pulls  
‘That sledge a horse pulls’ (Kálmán 1965:57)
- b. ti nē am wāylum  
that woman I know-1sg  
‘I know that woman’ (Kálmán 1965:53)

The following example shows quite clearly the contrastive topic nature of the argument preceding ‘anomalous’ *-ke*:

- (98) wōr-t jaln māχm-anuw tān wōr-uj nōwl’ tājim jalasēyt,  
forest-Loc going people-our they forest-animal meat eating go.around  
χūl-ťe jot wojlēyt, os χūl pājťēyt  
fish-if with take.away, then fish cook

<sup>26</sup>Kiss (1984) argues that since the argument under contrastive emphasis is not subjacent to its gap in the lower clause, such arguments are base-generated and not derived by movement. Whether the same is true of Mansi remains an open question but is irrelevant here.

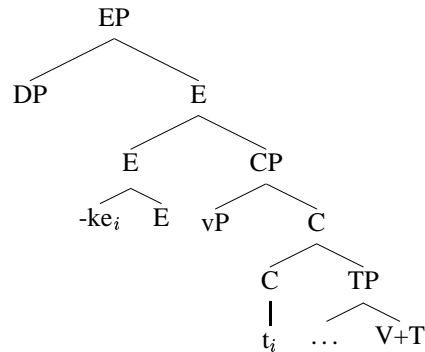
<sup>27</sup>Like Hungarian (Kiss 1994) and several other Finno-Ugric languages (Comrie 1981:122), Mansi also has a so-called focus ‘position’, normally the final argument before the Neg V+T sequence. A full discussion of the syntax of focus in these languages is beyond the scope of the present paper: what is important for present purposes is that left-dislocated arguments in Mansi, as in Hungarian, are not in focus position and occupy a position higher than focused arguments do.

‘Our hunters nourish themselves during the hunt with the meat of forest animals, but if they have taken away fish for themselves, then they cook fish.’ (Rombandeeva 1984:69)

In (98) the object argument  $\chi\bar{u}l$  ‘fish’ is contrasted in the discourse with  $w\bar{o}r-uj$   $n\bar{o}wl$  ‘meat of forest animals.’ Consequently,  $\chi\bar{u}l$  is left-dislocated to the left-periphery of the clause.

Kiss (1994) proposes that the position of a left-dislocated argument in Hungarian is not in Spec,CP but in the specifier of a higher functional projection *E(xpression)*.<sup>28</sup> Adopting the same idea for Mansi, we propose that C must raise to E in clauses where E has an overt specifier. This provides a straightforward explanation for anomalous *-ke*, since it will immediately follow the contrastive topic argument in Spec,EP:

(99) Clause Structure for Anomalous *-ke*



Our analysis predicts that anomalous *-ke* must always attach to a left-dislocated argument in Spec,EP. Indeed, in all examples we have available to us, this prediction is borne out and anomalous *-ke* is never attached to a clause-medial argument or in some other position. Such examples include all cases in which *-ke* precedes negation.<sup>29</sup> Where this occurs, *-ke* always follows a single clause-initial constituent:

- (100) a. [amki janmaltam aʏim]-**ke**      **aʏim** ɔlsən ...  
 myself brought.up daughter-1sg-if NEG be-2sg  
 ‘If you were not my brought-up-by-myself daughter ...’ (Riese 1984:77 citing Kannisto IV:38)

<sup>28</sup>But see Kenesei et al. (1998) for possibly problematic cases of unemphatic topics preceding ‘left-dislocated’ arguments in the clause.

<sup>29</sup>Riese (1984) seems to have grouped this structure with canonical second-to-last position cases, apparently construing negation as part of the predicate.

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- b. [šāne kos-fer-pāŋk]-**te at** tēs ...  
 mother fingernail-dirt-if NEG eat-past  
 'If he had not eaten his mother's fingernail dirt ... ' (Kálmán 1976:76)

In contrast, where *-ke* is in its canonical position immediately before V+T, several constituents can appear before *-ke*, and these appear in their canonical order, with the subject preceding any other non-adjunct arguments, showing that no left-dislocation has taken place:

- (101) a. Subj Obj-*ke* V+T  
 [piye] [ti nān]-**te** tēy  
 son-3sg this bread-if eat-3sg  
 'If her son eats this bread ... ' (Kálmán 1976:76)
- b. Subj Obj-*ke* V+T  
 [pupiɣ tawki] [nāl]-**ke** totiɣ-lə-s ...  
 spirit himself arrows-if bring-them-past  
 'If the protective spirit himself brought the arrows ... ' (Riese 1984:73  
 citing Kannisto I: 330)
- c. Subj PP-*ke* V+T  
 [sōrni kātəp χōtal] [samən]-**ke** patapi  
 golden ray sun eye-to-if fall  
 'If the golden sunbeams fall on (my) eyes ... ' (Kálmán 1976:112)
- d. Subj AP-*ke* V+T  
 āyi [[[pasan] šōpitaŋkwe] sawəŋ]-**te** āfim ...  
 girl table clear-inf bad-if not-be  
 'If a girl is not too lazy to clear the table ... ' (Rombandeeva 1984:  
 152-53)

### 9. Summary

In sum, the distribution of *-ke* shows complications which are not explained by an account which simply postulates that it selects as its structural host a following verb, as required by the ditropic analysis of Nevis (1988). Rather, we have shown that *-ke* behaves like another irrealis complementizer, (*w*)*os* 'so that', that its distribution is unlike that of adverbial adjuncts or *wh*-expressions, and that it may occur in positions in the clause aside from its typical pre-verbal one. The full range of facts is accommodated within an analysis in which *-ke* instantiates C and remains *in situ*, with the vP (and adjoined Neg and/or Adverbs) raising to the left

of it. Atypical distributions for *-ke* arise when either (1) the V+T complex raises to C, in which case *-ke* appears attached to the inflected verb itself, or (2) C raises to E, a functional projection above C in which contrastive topics are located, in which case, *-ke* is attached to a clause-initial constituent under a certain type of discourse emphasis.

While upon first examination *-ke* seems to exemplify Klavans' Type 5 clitic, we have argued that this is a misanalysis. Instead, *-ke* is simply a 'leaner', normally *in situ* syntactically, which parses as part of the preceding MWD's phonological word. Although Mansi *-ke* at first glance appears to exemplify the otherwise unattested 'ditropic' clitic type, in fact, its behavior is perfectly consistent with the model of grammar proposed here, which eschews ditropism entirely.

## 10. Conclusions

The treatment of Mergers that we have presented here establishes a number of basic points about movement operations in the post-syntactic derivation. In terms of locality, we have identified two different types of operation, Lowering and Local Dislocation, which are located in distinct stages of a sequential derivation on the PF branch. The primary claim here is that structural relationships play a defining role in determining the types of post-syntactic movement that are licit, and that the relevant structures are inherited from the syntactic derivation and subjected to further operations, such as Vocabulary Insertion and Linearization, which redefine the nature of subsequent Mergers. Within this framework comes a correlation between the type of operation that an element will undergo and the type of information required for the application of the operation— the *Local Dislocation Hypothesis*, which holds that Vocabulary Specific operations will necessarily apply under strict linear adjacency. The locality restrictions that govern Merger are further constrained by the condition that Merger operations merge like with like, in terms of the objects we define as *Mwds* and *Subwords*; that is, *Mwds* Merge with *Mwds* and *Subwords* with *Subwords*. Finally, the sequential nature of the theory that we develop is highlighted in cases like those examined in Latin and Lithuanian, in which the cyclic application of post-syntactic Mergers plays a crucial role.

The second part of the paper concentrates on a further set of effects that arise when the objects created by Merger are considered. The domains of phonological interaction and allomorphy associated with clitics or affixal elements, held in a number of Lexical accounts to exemplify sharp dichotomy between Lexical (=pre-syntactic) and Syntactic phenomena, are shown to be derivable in the Non-Lexicalist architecture that we advocate. In addition, a further set of cases predicted to exist by a Lexicalist typology of clitics (Klavans 1985) are simply ruled out, with apparent counterexamples reanalyzed. Taken together, the results of this



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paper provide a general model in which post-syntactic movements can be studied in terms of locality, morphological interaction (allomorphy), and phonological interaction; and the model makes clear and empirically testable predictions about what the morphological component does with the output of the syntactic derivation.

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