Clitics in Dependency Morphology

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Abstract

Clitics are challenging for many theories of grammar because they straddle syntax and morphology. In most theories, cliticization is considered a phrasal phenomenon: clitics are affix-like expressions that attach to whole phrases. Constituency-based grammars in particular struggle with the exact constituent structure of such expressions. This paper proposes a solution based on catena-based dependency morphology. This theory is an extension of catena-based dependency syntax. Following Authors et.al. (in press), a word or a combination of words in syntax that are continuous with respect to dominance form a *catena*. Likewise, a morph or a combination of morphs that is continuous with respect to dominance form a *morph catena*. Employing the concept of morph catena together with a hyphenation convention leads to a parsimonious and insightful understanding of cliticization.

1 Introduction

"Dependency morphology" was a short-lived affair. Anderson (1980) coined this label in his attempt to extend the dependency-based structuring of syntax to morphology. Yet even earlier, Heringer (1970: 96) considered the possibility of individual morphs entertaining dependency relationships. Morphological dependency structures crop up occasionally (Heringer 1973:283-294, 1996:117f, Eroms 2010: 38f), but a consistent discussion of morphological structure is curiously lacking from dependency-based approaches in general. The only exceptions are Mel'čuk (1988: 107, 2003: 193f.), where morphological dependency is discussed in detail, and within the Word Grammar framework of Creider and Hudson (1999) and Hudson (2003: 514, 518).[1] Due to this dearth of solid dependency-based explorations into morphological structure, it is not surprising that Maxwell (2003) bases his account of dependency concepts in morphology entirely on constituency-based proposals.

The possibility of complex words being structured in much the same fashion as sentences was proposed first in Williams (1981), and further discussed in the famous "head-debate" between Zwicky (1985a) and Hudson (1987). In contemporary morphological theories that attempt to inform syntax (predominantly within the generative framework) such as Di Sciullo (2005) and the theory of Distributed Morphology (Halle and Marantz 1993, Embick and Noyer 2001, 2007, Harley and Noyer 2003, Embick 2003), words are now seen as hierarchically structured items.

Seen in the light of this development, it is time for dependency grammar (DG) to make up for its neglect of morphological matters. The assessment by Harnisch (2003) that the development of a dependency-based morphology requires immediate attention is accurate. In this spirit, a proposal for a dependency-based morphology is sketched in the next section. The central idea builds on the notion of syntactic *catenae* as defined by Osborne et.al. (in press). Concepts defined in Section 2 are then used to address clitics.

2 Catena-based morphology

Adapting the definition of syntactic catenae by Osborne et.al. (in press), a *morph catena* is a MORPH OR A COMBINATION OF MORPHS THAT IS CONTINUOUS WITH RESPECT TO DOMINANCE. This definition identifies any morph tree or subtree of a morph tree as a morph catena. The choice of "morph" instead of "morpheme" is motivated by the need to maintain a surface-oriented level of analysis.[2] A *morph* is loosely defined as any meaning bearing unit that cannot be reduced any further, but that can be segmented from other meaning bearing units in the horizontal AND/OR vertical dimension. The inclusion of the notion "vertical dimension" allows for the treatment of phenomena subsumed under non-concatenative morphology. For reasons of space, however, non-concatenative morphology is not addressed in this paper.

If one wishes to see the interactions of morphs in the same manner as the interactions of words,

[1] In MTT morphological dependencies operate at strata entirely different from syntactic dependencies. In Word Grammar, morphology is feature-based, rather than morph-based.

[2] While there are certainly difficulties with the notions "morph" and "morpheme" (cf. Mel'čuk 2006: 384ff), the proposal here is sufficient in the present context.

then one must first distinguish dependency relationships between morphs within the same word, and then second between morphs across separate words.

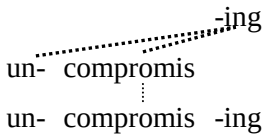
2.1 Intra-word dependencies

A dependency relationship between morphs inside the same word is called an *intra-word* dependency. Intra-word dependencies are determined by distribution. The formal definition is presented first:

> **Intra-word dependency**
> A morph M_1 is an intra-word dependent of another morph M_2, if the morph combination M_1-M_2 distributes more like an M_2-type unit than like an M_1-type unit.

This definition is similar to Mel'čuk's definition of "surface syntactic dominance" (2003: 200f). The next example illustrates intra-word dependencies:

(1)



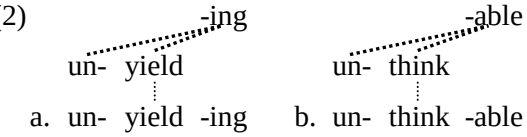
The intra-word dependencies are represented by dotted edges (as opposed to solid edges). Only the lexical morph *compromis* receives a (vertical) projection edge.

Hyphens are an important tool in this account. They represent prosodic dependencies (in the horizontal dimension). For instance, the negation prefix *un-* prosodically depends on the next morph to its right (here: *compromis*). The progressive suffix *-ing* prosodically depends on the next morph to its left (here: *compromis*).

A morph must receive either a hyphen or a projection edge, but never both. Morphological affixes always receive a hyphen, and therefore they can never receive a projection edge.

Reexamining example (1), the peripheral morphs are affixes and must therefore appear with hyphens and dotted edges. Note that the progressive immediately dominates both the prefix and the lexical morph. The progressive suffix dominates the lexical morph because *compromising* is a valid word. The expression **un-compromise*, however, does not exist, hence the prefix cannot depend on the lexical morph. Rather the negative prefix must depend on a morph that has some adjectival features. Since the progressive morph can appear as an adjective-like expression, such as *an uncompromising person*, the negative prefix must depend on the progressive suffix. Further examples of this ilk are shown below:

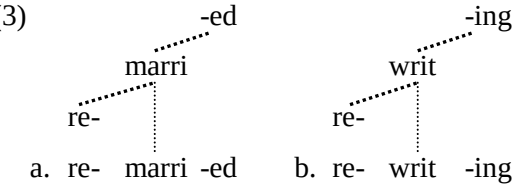
(2)



Since **un-yield* and **un-think* are bad, the prefixes must depend on the final (adjectival) morphs *-ing* and *-able*.

Somewhat different structures from those in (1) and (2a-b) appear with the prefix *re-* in *re-marri-ed* and *re-writ-ing*:

(3)



The analyses in (3a-b) are correct because the expressions *re-marry* and *re-write* are good.

2.2 Inter-word dependencies

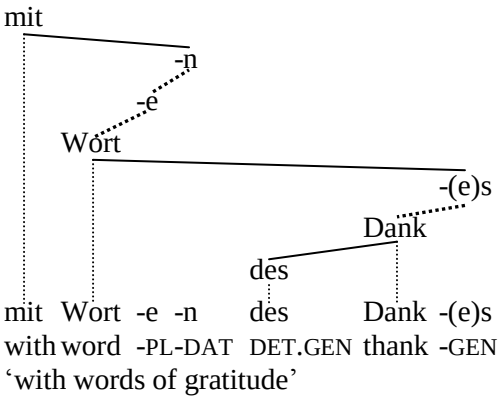
An inter-word dependency is a morphosyntactic relationship between a morph and a word. If the morph licenses the appearance of the word, the morph *governs* the word. The formal definition is again presented first:

> **Inter-word dependency (government)**
> A morph M in a word W_1 governs another word W_2, if M licenses the appearance of W_2.

This definition is similar to Mel'čuk's omissibility and cooccurrence properties of syntactic dominance (2003: 205).

The next example from German illustrates two inter-word dependencies:

(4)



Example (4) shows two instances of inter-word dependency relationships. The first concerns the morph *mit* and the word *Wort-e-n*. The structure of the latter is established independently through intra-word dependency: *Wort-e* distributes like

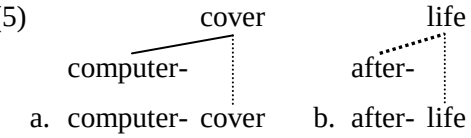
any plural noun, and *Wort-e-n* distributes like any dative marked noun. The preposition *mit* is both a morph and a word. Because this prepositional morph only licenses *Wort-e-n*, but not *Wort* or *Wort-e*, *mit* governs *Wort-e-n*.

The second inter-word dependency concerns the morph *Wort* and the word *Dank-(e)s*. The bracket indicates the phoneme /e/ is optional. The morph *Wort* requires the masculine noun *Dank* to appear with a genitive case suffix (here: *-(e)s*). In other words, the morph *Wort* licenses the appearance of *Dank-(e)s*, but not of *Dank*. The dependency relationship between the article *des* and *Dank-(e)s* is purely syntactic.

2.3 Compound structure

A lexical morph does not automatically receive a projection edge. In some cases, lexical morphs appear very similar to affixes, barring their meaning, of course. Compounding is a case in point:

(5)



In (5a), the initial morph *computer-* is certainly a lexical morph because it can appear on its own. The initial *after* usually appears as a preposition. Nevertheless, in *computer-cover* and *after-life*, both *computer-* and *after-* have lost the ability to stand alone and have been integrated into their respective compound. The hyphens symbolize the inability to constitute a prosodic word alone.

The next matter concerns the angled dependency edges. In (5a) the dependency edge is solid, much like a syntactic dependency edge. In (5b) however, the dependency edge is dotted. This distinction addresses a semantic difference. In (5a) *computer-* is still subject to further modification, as in *desk-top-computer-cover*, where the computer is of the desktop type. The morph *after-* in (5b), however, cannot undergo modification. In *after-life*, *after-* functions much in the manner of a lexical prefix. On the other hand, *computer-* in (5a) lies between a pure syntactic dependency relationship and the type of morphological relationship that affixes have with their lexical morphs.

In compounds, a non-initial compound part must appear with a hyphen and the dependency edge must be solid if this compound part can still be modified, or it must be dotted if modification is impossible.

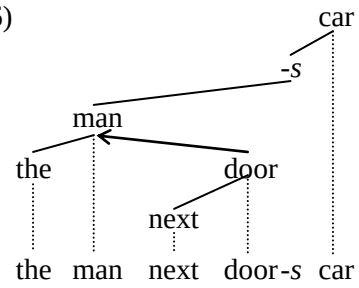
The distinctions drawn above open the door to a principled analysis of clitics. Clitics share much with initial compound parts such as *computer-* in (5a): *computer-* has lost its ability to constitute a prosodic word. Clitics never constitute prosodic words. Therefore all clitics must receive a hyphen. While *computer-* in (5a) has retained much of its semantic autonomy, clitics are syntactically autonomous. Therefore the dependency edge of a clitic must be solid, as opposed to a dotted edge which connects affixes to lexical morphs (or other affixes).

3 Clitics

Clitics are morphs on the borderline between free and bound morphs (Zwicky 1977, 1985b, 1987, Klavans 1985, Kaisse 1985, Borer 1986, Nevis 1986, Anderson 1992, 2005, Halpern 1995, 1998, Halpern and Zwicky 1996, Gerlach 2002, Hudson 2007:104f). Clitics express meanings usually reserved for free morphs, but fail – for whatever reasons – to appear as individual prosodic words. In the current system, these properties are expressed by the following tree conventions: A clitic appears with a hyphen and a solid dependency edge but without a projection edge.

This convention is illustrated with the next example:

(6)



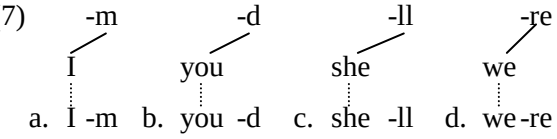
The (italicized) possessive *-s* depends on the following noun *car*, seemingly like a full word. It also governs the noun *man* like a full noun. However, the clitic appears without a projection edge in exactly the fashion affixes would. Like affixes, the clitic is prosodically dependent on a morph capable of constituting a prosodic word (here: *door*), or it must depend on a morph that depends on such a morph, and so on, recursively.

Clitics also subsume contractions, cf. Zwicky and Pullum (1983). The parts after the apostrophe in English *I'm*, *you'd*, *she'll*, *we're*, etc. are cliticized to the pronouns[3]. The phonological reduction of the auxiliaries causes them to be-

[3] Pronouns are used here for simplification. But cliticization to other word classes is possible (cf. Zwicky and Pullum 1983: 504).

come prosodically dependent on the pronominal morphs. Hence a hyphen is required for the reduced auxiliaries. A solid dependency edge must connect the pronominal morphs and the contractions because the latter are still syntactically autonomous. Their structure is shown next:

(7)



Even though the reduced auxiliaries are prosodically dependent on their pronouns, they dominate their pronouns as they would if not reduced. Many clitics, though, do not entertain dependency relationships with their hosts. Prosodic dependency and dominance are therefore logically independent properties. The necessity to distinguish these two dimensions is addressed in the next section.

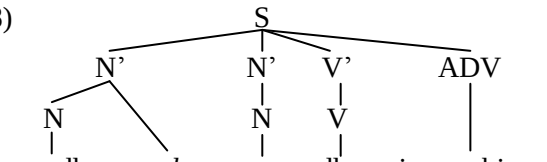
3.1 Horizontal and vertical dimension

Comparing affixes and clitics, one sees an important difference: affixes must entertain intra-word dependency relationships with morphs contained WITHIN the same word. I.e. for a morph to be an affix, this morph must either be an intra-word dependent or an intra-word head of another morph contained within the same word. Examine again the word *Wort-e-n* of example (4): the morphs *-e* and *-n* are affixes because they must reside within the prosodic word structure constituted by the lexical morph *Wort*. The plural suffix *-e* dominates and prosodically depends on the morph *Wort*. As a result, this suffix is integrated into the prosodic word structure of the morph *Wort*. The dative suffix *-n* dominates and prosodically depends on the plural suffix *-e*. Because the plural suffix is already a part of the prosodic word structure of *Wort*, the dative suffix can – via prosodic dependency – be integrated into the same prosodic word structure. In sum, prosodic and dependency structure coincide for affixes.

In cliticization, however, prosodic dependency structure and standard dependency structure are logically independent. The prosodic dependency preference of a clitic says nothing about the hierarchical status of that clitic. Since a description of clitics requires the distinction between prosodic dependency (a linear/horizontal order phenomenon) and standard dependency/dominance (a vertical order phenomenon), those grammars that do not sufficiently distinguish between these dimensions experience considerable difficulties when attempting to produce an insightful and intuitive treatment of clitics.

These difficulties are evident in two diametrically opposed approaches to syntax. The first approach is epitomized by constituency-based grammars. The apparatus in GB-theory, for instance, is geared toward generating the appropriate word order, i.e. the linear order of utterances. In the account of Klavans (1985) for instance, the GB apparatus leads her to posit parameters that exclusively apply to the horizontal dimension. Klavans' (1985: 97f) posits "dominance", "precedence", and "phonological liaison". [4] These concepts are illustrated with a Ngiyambaa example (a Pama-Nyungan language spoken in New South Wales) taken from Klavans (1985: 101, her tree conventions and gloss):

(8)

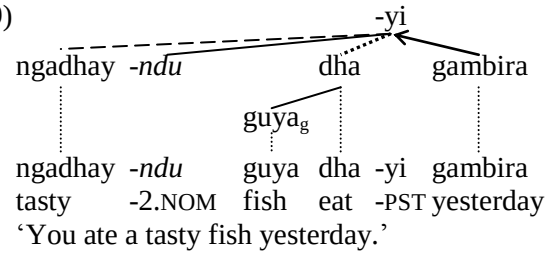


'You ate a tasty fish yesterday.'

According to Klavans (1985: 97f), the italicized clitic *=ndu* appears in a domain characterized by the following parameters: "dominance" is "initial" because the clitic appears with the first constituent under S. "Precedence" is "after" because the clitic appears after the first constituent under S. "Phonological liaison" is "enclitic" because the first constituent is also the host of the clitic.

The structure proposed in (8) displays one serious problem concerning the first N', however: it does not in any insightful manner clarify the dependency structure of the clitic. The reason for this insufficiency is the inability of constituency-based grammars to represent dependency relationships. The clitic should, namely, depend on the verb *dha-yi*. A dependency tree of (8) is shown next:

(9)



'You ate a tasty fish yesterday.'

The adjective *ngadhay* has undergone *rising* (see Section 3.2) due to the splitting of the NP. The

[4] Anderson (2005: 81) suggests "anchor" instead of "dominance".

adverb *gambira* receives an arrow, the arrowhead pointing towards the head; this type of dependency edge marks adjuncts (cf. ex.6). The comparison of (8) and (9) shows that (9) accurately displays the relevant information concerning the clitic *-ndu*: *-ndu* depends on the tense suffix on the verb (dependency structure), AND it prosodically depends on to the preceding adjective. Klavans' (8) suggests, however, that the clitic is somehow part of the constituent formed by the adjective. This assumption is wrong, but the motivation by which one arrives at this assumption is clear. Unlike the current dependency-based apparatus, the constituency-based apparatus employed in (8) is not capable of representing both the syntactic and prosodic relationships simultaneously.

Examples of the second type of the two diametrically opposed approaches are dependency-based grammars that see linear order as derived, e.g. Mel'čuk's MTT or dependency-based topology models (Duchier and Debusmann 2001, Gerdes and Kahane 2001, 2006). In general, this type of grammar has no problem representing dependency structure, but must derive linear order by an additional topological model. With respect to cliticization, it is difficult to assess this approach fairly because only Gerdes and Yoo (2003) seem to address the matter (focusing on Modern Greek). They posit a clitic field within an embedded domain. Due to the scarcity of information on this matter within topological models, it is impossible for me to present a topology-based structure of (8).

It may be relatively safe to assume, though, that topological models are going to face problems with K^{w}ak^{w}'ala clitics. Consider the next fragment from an example by Anderson (2005: 16):

(10) a. yəlk^{w}əmas *-ida* bəgwanəma -x̣ -a…
cause hurt -DEM man -OBJ -DEM
'The man hurt [the dog with a stick].'

Even though the italicized demonstrative clitic prosodically depends on the preceding verb *yəlk^{w}əmas* 'cause hurt', it modifies the following noun *bəgwanəma* 'man'. Similarly, the two clitics *-x̣-a* do not modify the preceding noun *bəgwanəma* 'man' to which they attach, but rather they modify a following noun (which is not shown). Constituency-based models as well as topological models must now reconcile two different structures: prosodic and constituent structure:

(10) b. [yəlk^{w}əmas *-ida*] [bəgwanəma…
[cause hurt -DEM] [man...
c. [yəlk^{w}əmas] [*-ida* bəgwanəma]…
[cause hurt] [-DEM man]

(10b) shows the prosodic word structure; the clitic *-ida* is shown as a part of the prosodic word structure of the verb. The noun constitutes a separate prosodic word, of which the clitic is NOT a part. (10c) shows the constituent structure: here the clitic forms a constituent with the noun. In this structure, the clitic is excluded from the word structure of the verb.

Prima facie it is not evident how one proceeds from the prosodic structure (10b) to the dependency structure (10c), which is what constituency-based grammars would like to accomplish. Nor is it clear how topological models might distinguish the prosodic/topological structure (10b) from the dependency structure (10c), which they see as primary.

Topological models might point to the fact that K^{w}ak^{w}'ala clitics are enclitics, and they must therefore prosodically depend on immediately preceding material. The distinction between proclitics and enclitics, while self-evident at first blush, is not as clear-cut as it seems. In some languages, one and the same clitic can appear with both orientations, a fact that blocks any attempt at positing universal orientation preferences. The next European Portuguese example, taken from Anderson (2005: 85), shows that orientation preference is not a property inherent to the clitic, but rather that it is contingent on the prosodic context:

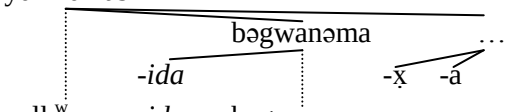
(11) a. Só o Pedro *o-* viu.
only ART Pedro him-saw
'Only Pedro saw him.'
b.*Só o Pedro viu-*o*.
c. Viu-*o* só o Pedro.
d.**O*-viu só o Pedro.

(11a) shows the object clitic *o-* as a proclitic. (11b) shows that this clitic may not follow the final verb. (11c) shows that it must be enclitic on an initial verb, but may not precede the initial verb (11d). A topological modal can, of course, simply posit respective clitic fields after an initial verb field, and before a final verb field. Doing so, however, seems *ad hoc*. The contingency that the prosodic context poses (for a clitic to appear as a proclitic as opposed to an enclitic, or vice versa) does not – in any discernible way – follow from its dependency structural context. In contrast, Klavans' (1985) account can easily provide a

systematic distinction between the cases (11a) and (11c), and rule out the cases (11b) and (11d).

The examples from Ngiyambaa, K^{w}ak^{w}'ala, and European Portuguese and the difficulties they pose force one to the assumption that linear/horizontal order and dominance/vertical order are ultimately distinct, and that neither is derivable from the other. The current theory accommodates this insight by positing two different tools to represent these distinct dimensions: hyphens for linear order, and solid, dotted, or dashed (in case of rising) dependency edges for vertical order. Reexamining the K^{w}ak^{w}'ala data from (10a), the current theory can provide a tree representation that visualizes the linear (prosodic) relationships and the vertical (dominance) relationships:

(12) yəlk^{w}əmas

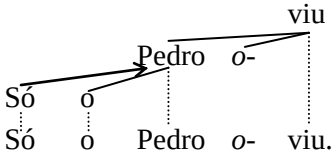


yəlk^{w}əmas -*ida* bəgwanəma -x̣ -a …
cause hurt -DEM man -OBJ -DEM
'The man hurt [the dog with a stick].'

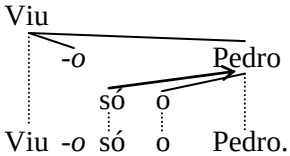
The clitic is marked in two ways, the one way indicating its prosodic dependency and the other its standard vertical dependency. The hyphen on its left side indicates that *-ida* must prosodically depend on the initial verb. The solid dependency edge, however, indicates that it is dependent on the noun. Equally for the clitics *-x̣-a*: *-x̣* prosodically depends on *bəgwanəma*, and *-a* prosodically depends on *-x̣*. Hence both clitics end up integrated into the prosodic word structure of *bəgwanəma*. These clitics depend, however, on a following noun (not shown), which they modify.

The European Portuguese example receives an equally parsimonious analysis: (11a) is shown as (13a), and (11c) as (13b):

(13)



a. Só o Pedro *o-* viu.
only ART Pedro him-saw
'Only Pedro saw him.'



b. Viu *-o* só o Pedro.

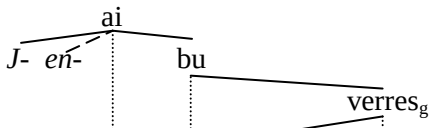
The fact that (11b,d) are ungrammatical has nothing to do with clitic orientation preference, rather orientation is forced on the clitic by the prosodic context of its head, the verb *viu*. If the verb is in V1 position, the clitic must appear as an enclitic; if the verb is in VF position, then the clitic must appear as a proclitic.

3.2 Clitic rising

A well known fact is that clitics can exhibit displacement. This phenomenon is known as "clitic climbing". Building on the work of Groß and Osborne (2009), displacement is understood here as *rising*. The displaced catena is seen as *risen*, which is indicated by the dashed edge. The governor of the risen catena is marked with a g-subscript. The *Rising Principle* states that the head or the root of a risen catena must dominate the governor of that catena. Clitics fully obey this principle when they appear displaced.

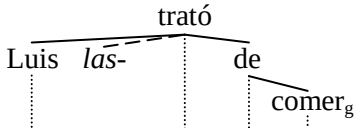
Clitic rising is well documented throughout the Romance language family. A French and a Spanish example, taken from Halpern (1998: 106), illustrate clitic rising:

(14)



J- en- ai bu deux verres
I of.it have drunk two glasses
'I have drunk two glasses of it.'

(15)

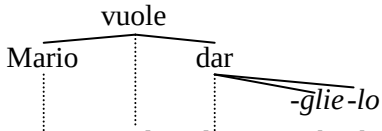


Luis las- trató de comer
Luis them tried to eat.INF
'Luis tried to eat them.'

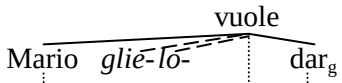
In the French example (14), two clitics appear: the subject clitic *J-* and the clitic *en-*. The latter has risen, its governor being *verres*. The Spanish example (15) shows the object clitic *las-* as risen, its governor being *comer*.

Some languages require all clitics to either rise or stay. Italian is such a language, as the next example demonstrates (taken from Anderson 2005: 246f):

(16)



a. Mario vuole dar *-glie-lo*.
Mario wants to.give him it
'Mario wants to give it to him.'



b. Mario *glie-lo-* vuole dar.

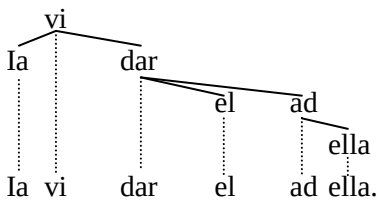
c.*Mario *lo*-vuole dar-*glie*.

d.*Mario g*lie*-vuole dar-*lo*.

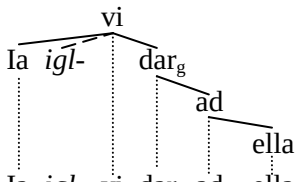
(16a) shows both clitics dominated by their governor *dar*. (16b) shows both clitics as risen: they are now dominated by *vuole*, which dominates their governor *dar*, thus obeying the Rising Principle. (16c,d) show that individual rising is ungrammatical. Either no clitic rises, or all clitics rise.

Surmiran, a dialect of the Romansh language group (Switzerland), allows clitic rising, but disallows multiple occurrences of clitics. The data are again from Anderson (2005: 247f):

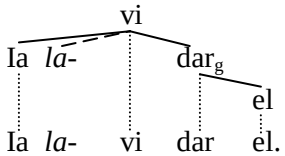
(17)



a. Ia vi dar el ad ella.
I want to.give it.m to her
'I want to give it to her.'



b. Ia *igl-* vi dar ad ella.
it.m



c. Ia *la-* vi dar el.
to.her

d.*Ia *igl-la*-vi dar.

e.*Ia *la-igl*-vi dar.

Example (17a) does not contain clitics, nor does it exhibit rising. In (17b), the direct object clitic *igl-* rises to attach to the matrix verb *vi*. In (17c), it is the indirect object clitic *la-* that rises and attaches to *vi*. Examples (17d,e) show that multiple rising of clitics is disallowed. (17f,g) show that the occurrence of multiple clitics is bad.

3.3 Clitic doubling

Another phenomenon which merits attention is "clitic doubling". Clitic doubling obtains when a clitic co-occurs with a full NP carrying the same grammatical function. While French prohibits clitic doubling, Spanish clitic doubling is sensitive to a variety of criteria. Clitic doubling is optional in the presence of an indirect object or an animate direct object, both preceded by the preposition *a*. But doubling of an inanimate direct object without this preposition is ungrammatical. And with a pronominal object, doubling is obligatory. Four examples from Halpern (1998: 107f) illustrate the differences:

(18) a. (*le-*) puso comida al canario.
him put.3sg food to.the canary
'S/he gave food to the canary.'

b. (*la-*) oían a Paca.
her listened.3pl to Paca
'They listened to Paca.'

c.**lo-* compró el libro.
it bought.3sg the book
'S/he bought the book.'

d. ellos *(*la-*) llamaron a ella.
they her called.3pl to her
'They called her.'

Here the clitics are italicized and their doubles underlined. The brackets on the clitics indicate that the occurrence of the clitic is optional. In (18a), *al canario* is the indirect object; since the preposition is present, optional doubling is grammatical. (18b) shows the direct object *a Paca*. Here, too, optional doubling is allowed. In (18c) the direct object *el libro* is inanimate and the preposition *a* is absent. Hence doubling is ungrammatical. (18d) shows the pronominal object *a ella*. Here the asterisk indicates that optionality is ungrammatical; clitic doubling must occur in this case.

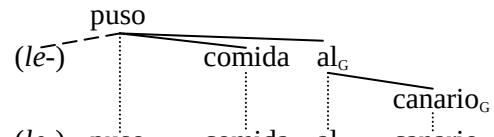
While it is understood that clitic doubling is sensitive to animacy and specificity, such that animate objects and specified objects allow clitic doubling, while inanimate objects and unspecified objects disallow it, the status of the clitic in terms of syntax and subcategorization remains beyond principled understanding (see the discussion in Halpern 1998: 107f). Concerning the syntactic status of doubling clitics, the traditional view is to treat them as adjuncts. This assumption, however, causes problems with subcategorization, in particular concerning case assignment.

In order to explain the Spanish examples (18a-d) an augmentation of the notion *governor* is necessary. Two facts back this step: first, clitic doubling in Spanish occurs in the presence of the preposition *a*. Second the pronominal clitics are sensitive to animacy (and pronominal) features. These two facts imply that neither the preposition *a* nor the nominal governed by this preposi-

tion alone suffice as the governor of the clitic. The combination of the preposition *a* AND the nominals, however, does fulfill all requirements for a governor of the clitics. The preposition *a* and the nominal qualify as a catena, hence they constitute the *governor catena* of the clitic.

The second issue concerns the syntactic status of the clitics. As long as the clitics are optional, they are seen as adjuncts. The dependency edges of optional clitics must therefore be arrows (cf. ex. 6, 9, 13). An analysis of the Spanish examples (18a-d) is now provided:

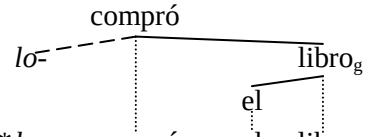
(19)



a. (*le-*) puso comida al canario.
him put.3sg food to.the canary
'S/he gave food to the canary.'

The governor catena is the word combination *al canario*. Both words receive a G-subscript, which is capitalized to help indicate that the entire catena is the governor of the clitic *le-*. Finally, rising must obtain (because the clitic is separated from its governor catena) so that domination is impossible. Note that the Rising Principle is obeyed: *puso*, the head of the clitic *le-*, dominates the governing catena *al canario* of the clitic. A similar analysis also holds for (18b).

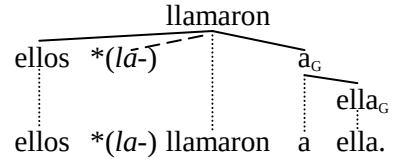
(19)



c.* *lo-* compró el libro.
it bought.3sg the book
'S/he bought the book.'

(19c) is bad because the governing catena of the clitic is incomplete; the preposition *a* being absent; case cannot be assigned to the clitic.

(19)



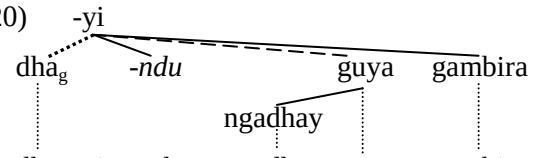
d. ellos *(*la-*) llamaron a ella.
they her called.3pl to her
'They called her.'

Here, the governor catena is *a ella*.

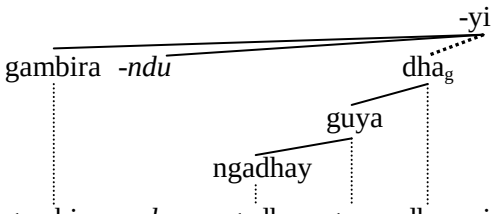
3.4 Second position clitics

"Wackernagel" or "second position" clitics challenge many theories. In quite a number of languages, clitics tend to cluster in a position roughly called the "second position" or the "Wackernagel position". Ngiyambaa (cf. ex.8, 9) is a case in point. The subject clitic *-ndu* '2.NOM' must appear after the first prosodic word, regardless of that word's category or syntactic function. Therefore, change of word order does not affect the positional appearance of the clitic as the next examples taken from Klavans (1985: 101) demonstrate:

(20)



a. dha -yi -ndu ngadhay guya gambira
eat -PST -2.NOM tasty fish yesterday
'You ate a tasty fish yesterday.'

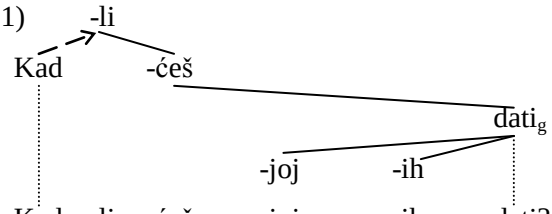


b. gambira -ndu ngadhay guya dha -yi
yesterday-2.NOM tasty fish eat -PST
'You ate a tasty fish yesterday.'

The difference between (9) and (20a,b) is a matter of focus. The first position is a focus position. Hence the adjective *ngadhay* 'tasty' is focused in (9), the verb *dha-yi* 'ate' in (20a), and the adverb *gambira* 'yesterday' in (20b). Regardless, the subject clitic must prosodically depend on the first prosodic word. Its dependency structure, however, is constant because it must always depend on the verb.

In Serbo-Croat, multiple clitics appear in second position, obeying a specific order. Following Corbett (1987: 406), the Serbo-Croat second position has six slots in the following order: I. interrogative *-li*, II. verbal auxiliaries, III. dative, IV. genitive, V. accusative (weak) pronouns, and VI. *-je*, the 3sg copula. The following dominance order among these slots can be assumed: the first slot dominates everything else; slot II tends to dominate to the right, but depends to the left on a slot I clitic if such a clitic is present. Slots III-V are dependent to the left, but can undergo clitic climbing. Slot VI tends again to dominate everything else. The plausibility of this assumption is now illustrated with two examples taken from Halpern (1998: 109). The indices on the clitics indicate their slot position.

(21)

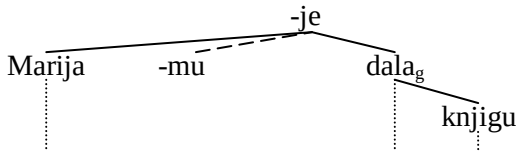


Kad -li$_{I}$ -ćeš$_{II}$ -joj$_{III}$ -ih$_{V}$ dati?
when INT 2sg.FUT 3sg.f.DAT 3pl.ACC give
'When will you give them to her?'

The slot II clitic depends on the slot I clitic which is the root. The slot II clitic dominates the infinitive verb to the right. The pronominal clitics of the slots III and V depend on the verb to the right (as would slot IV clitics). The question word *Kad* has risen.

The next example shows that the slot VI copula *-je* must again dominate other material:

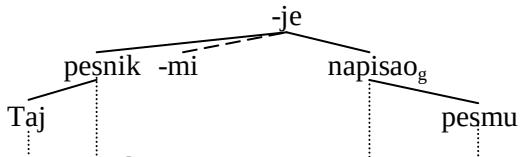
(22)



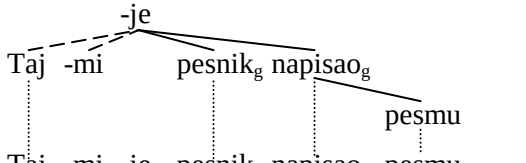
Marija -mu$_{III}$ -je$_{VI}$ dala knjigu.
Maria.NOM 3sg.m.DAT COP gave book
'Maria gave him a book.'

The pronominal clitic *-mu* must rise, its governor being *dala*. Note that in (21, 22), the clitics invariably depend prosodically on the first prosodic word, but that the clitics' dependency structure can vary considerably. The Serbo-Croat second position is purely defined in prosodic terms: the second position is located after the first stressed prosodic unit. This can lead to NP splitting as the next example from Corbett (1987: 406) illustrates:

(23)



a. Taj pesnik -mi$_{III}$ -je$_{VI}$ napisao pesmu.
that poet 1sg.DAT COP wrote poem
'That poet wrote me a poem.'



b. Taj -mi$_{III}$-je$_{VI}$ pesnik napisao pesmu.

In (23a) the first stressed prosodic unit is the prosodic phrase *Taj pesnik*. Hence the pronominal clitic *-mi* rises in order to attach to *pesnik*; as a result it is dominated by *-je*. In (23b) one sees the splitting of the NP: here the demonstrative is the first stressed prosodic unit. This causes the demonstrative to undergo topicalization rising. The pronominal clitic must again rise and it depends prosodically on the demonstrative.

4 Conclusion

This paper has demonstrated that cliticization can be captured parsimoniously in a catena-based dependency morphological account. Due to the capability of dependency-based structures to distinguish clearly between the horizontal dimension of precedence, where the phonology and prosody of cliticization operates, and the vertical dimension of dominance, where standard syntactic dependency operates, a unified account of cliticization is possible. Cliticization phenomena can be captured with the same notions that are already required to perform a morphological analysis within and across words. The intuition that clitics seem to operate much as individual words in syntax was shown to hold true with clitic rising, which is indistinguishable from syntactic rising. The catena and the Rising Principle together make a fluid transition from morphology to morphosyntax and further to syntax possible.

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