

# Feature Geometry and Head-Splitting in the Wolof clausal periphery\*

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## 1 Introduction

This paper is a study of the morphosyntax of the clausal periphery in the Niger-Congo language Wolof, specifically the two layers commonly labeled CP and TP/InflP. I investigate how these layers are related, and how their relationship should best be modeled. Two issues are at the core of this work: the connection between the heads traditionally called C and T/Infl, and the distribution of syntactic features across heads in the functional spine.

It has long been noted that the head that hosts the complementizer and the head that hosts the subject (and in some languages features such as tense and agreement) share a number of properties. In English, it is generally assumed that the finite and the infinitival T are selected by different complementizers, and that the lack of a finite C results in the lack of  $\phi$ -features on T and its inability to license a nominative subject. A more obvious connection between C and T is observed in languages in which C exhibits features traditionally associated with verbal inflection, such as  $\phi$ -features and tense (e.g. Irish, Kinande, Lubukusu, Bavarian, West Flemish). All this has led to various formal implementations of the relationship between C and T, most recently in the form of a theory of *Feature Inheritance*, according to which all formal features are generated on phase heads and appear on lower heads only by being passed down (Chomsky 2005, 2008; Richards 2007, 2011). It was, however, quickly noted that the prediction that all features (aside from the Edge feature) are passed down is too strong, and that often some T/Infl-like features are found on C, appear on both C and T/Infl, or are bundled on one head (e.g. Fortuny 2008; Ouali 2008; Legate 2011; Miyagawa 2010, 2017; Gallego 2014, 2017).

It is also a long-standing observation that languages differ in the amount of structure over which functional features are distributed. For example, tense, mood, and agreement

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can be expressed on multiple heads in some languages, and contained on one head in others (e.g. Giorgi and Pianesi 1996; Bobaljik and Thráinsson 1998), as can features found on Voice and *v* (Pylkkänen 2002, 2008; Harley 2017), and elsewhere. I call the structure in which features are spread out over multiple heads *cartographic*, referencing the work within the Cartographic project, aimed at creating a detailed inventory and hierarchy of functional categories (a.o. Rizzi 1997, 2002, 2004; Cinque 1999, 2006), and the structure in which features are bundled on fewer heads *non-cartographic*. This cross-linguistic variation is usually captured via parametrization, however, this cannot easily account for cartographic and non-cartographic effects in the same part of the structure within one language.

I here propose a structure-building mechanism which can capture both the C-T/Infl relationship, and the variation in the distribution of features over syntactic heads. I argue that features of C and T/Infl are bundled together, and that this feature bundle can be divided into multiple heads via a mechanism I call *Head-Splitting*, which allows parts of feature bundles to reproject and create new heads. The proposal is illustrated through a detailed exploration of the C-Infl domain in Wolof, which turns out to be highly relevant for the advancement of our understanding of the link between syntactic positions at the clausal periphery and the distribution of features that inhabit them.

Wolof clauses contain overt *sentence particles* – complementizer-like elements whose presence is obligatory in order for the clause to contain tense (Njie 1982) or negation (Zribi-Hertz and Diagne 2003), which directly points to a link between C and the heads in the inflectional layer. Works in both the descriptive and the generative tradition identify up to a dozen of these elements (Mangold 1977; Church 1981; Dialo 1981; Njie 1982; Robert 1991; Dunigan 1994; Zribi-Hertz and Diagne 2002; Torrence 2005, 2012), however, a careful inspection of their morphosyntax reveals that all particles occurring in finite indicative clauses can be divided into two groups: those in which a verb is located in the same head as the particle, which I term *V-raising clauses*, and those in which an A'-moved XP occupies its specifier, the *Wh-raising clauses*. They are exemplified in (1) and (2), with sentence particles in bold face.

- |   |  |
|---|--|
| <p>(1)     <u><i>V-raising: Neutral clause</i><sup>1</sup></u><br/>         (Xale yi)    lekk-<b>na</b>=ñu gato.<br/>         child the.PL eat-C<sub>V</sub>=3PL cake<br/>         “The children ate cake.”</p> | <p>(2)     <u><i>Wh-raising: Wh-question</i></u><br/>         Lan <b>la</b>    {=ñu/xale yi}    lekk?<br/>         what C<sub>Wh</sub> 3PL/child the.PL ate<br/>         “What did {they/the children} eat?”</p> |
|---|--|

There are three syntactic differences between V-raising and Wh-raising clauses. In (1), the verb is located to the left of the particle *na*. The optional non-clitic subject is also to the left of the particle (and to the left of the verb). And finally, there is an obligatory subject clitic right-adjacent to *na* (*ñu*). In (2) the verb is below the sentence particle *la*, with the *wh*-phrase (here the object) to its left. Crucially, in this clause-type, the non-clitic and the

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<sup>1</sup>Abbreviations used in this article: CM = class marker, INF = infinitive, IPFV = imperfective, LOC = locative clitic, OBJ = object clitic, PL = plural, PST = past tense, SG = singular, STR.PRON = strong pronoun.

clitic subject are in complementary distribution to the right of C, and one is obligatory.

At first glance, V-raising clauses do not appear to have an overt CP-layer, in fact, based on (1), we may be tempted to classify Wolof as a null-subject language with subject-verb agreement. Familiarizing ourselves with the morphosyntax of sentence particles, however, forces us to classify *na* as one, meaning that the verb is high, in C. The lexical subject in V-raising, however, cannot occur below C; only a clitic is permitted, which is adjoined to C. There is therefore one specifier position in these clauses, to the left of the sentence particle. The Wh-raising clause in (2) presents a different picture. The lexical subject and *ñu* (which we might identify as agreement in V-raising clauses) are in complementary distribution in what appears to be the traditional subject position below C. Additionally, this position must always be filled, either by a lexical subject or a subject clitic, unlike the subject position to the left of C in V-raising clauses. The position to the left of C in Wh-raising clauses is occupied by an A'-moved phrase. There are therefore two specifier positions in Wh-raising, one hosting the subject, and one hosting the Wh-moved phrase.

The main argument in this paper is that the superficial description of the two clause-types I just presented is very much on the right track. V-raising clauses have one high functional projection, whose head combines the features of both C and the head typically hosting the subject in its specifier; here Infl. Since C and Infl are not separate projections in V-raising clauses, I argue that there is no clause-internal position for the lexical subject in such clauses – it can only occur in the left periphery, and is resumed by a clitic.

Wh-raising clauses have separate C and Infl projections: there is a higher head with an overt complementizer and a *wh*-moved nominal in its specifier, and a lower one, hosting the subject. I derive the difference between V-raising and Wh-raising clauses by proposing that C and Infl start out as a single head, which either stays compact, or splits, depending on purely syntactic factors. The main contribution of this paper is the development of the mechanism of *Head-Splitting*, which distributes the features between the two heads.

The paper proceeds as follows. In section 2 I discuss the syntax of sentence particles, subject clitics, and non-clitic subjects, and the core data to be analyzed in the remainder of the paper. Sections 3 and 4 develop the analysis for two Wolof clause-types. Section 5 discusses the broader implications of the analysis, and section 6 concludes. In the Appendix, I discuss data from clauses with nominal predicates, which appear to have properties of both V-raising and Wh-raising clauses and present a potential challenge for the analysis.

## **2 Wolof clause-types, complementizers and subjects**

In this section I present the main data that this paper addresses: the two clause-types, one I call V-raising, and another I call Wh-raising, which, I argue, differ in the distribution of the features traditionally associated with a C-like and a T/Infl-like head; in the former, they are bundled on one head, in the latter, distributed over two heads. This has consequences for the type of clause-internal subject (i.e. a subject to the right of the sentence particle) that can occur in each sentence type. I develop the argument by justifying a number of claims about the clausal architecture I am advocating. First, I show that sentence particles

belong to the same category and can be treated as a low left-peripheral head, most similar to C/COMP. Next, I argue that subject markers must be treated as pronominal clitics (as in Dunigan 1994; Russell 2006; Martinović 2015a), and not as agreement (as in, e.g. Zribi-Hertz and Diagne 2002; Torrence 2005, 2012). Finally, the claim that all sentence particles are in the same, C-like, position, predicts that subjects to the left and those to the right of the sentence particles are in different syntactic slots. Empirical evidence, showing that non-clitic subjects to the left of the sentence particle have different properties from clause-internal subjects, supports this.

## 2.1 Two clause-types

All finite indicative clauses in Wolof contain one of what appear to be a variety of sentence particles. My view of these elements broadly follows Dunigan's (1994) analysis, who argues that they belong to the same category – for her, a Sigma head. I treat sentence particles as low complementizers hosted by the head that combines the features of C and Infl, which I here call CI. (3) shows the clausal structure argued for in this paper. I will demonstrate that CI is sometimes realized as a single head, and sometimes split into two heads. Wolof also possesses a higher embedding complementizer *ni*, which can embed a clause with any of the sentence particles. I separate the Tense head from the part of the clause I discuss here, and give evidence that T is lower than CI and does not host the subject in its specifier. Examples of clauses with different sentence particles are given in (4).

- (3) Wolof clause structure  
 $[_{CP-EMB} \textit{ni} [_{TopP} [_{CIP} \textit{sentence particles} [_{TP} [_{vP} [_{VP} ] ] ] ] ] ] ]$

- (4) Wolof sentence particles
- |    |   |                                   |
|----|---|-----------------------------------|
| a. | Xale yi      lekk- <span style="border: 1px solid black;">na</span> =ñu mafe.<br>child the.PL eat-C=3PL    mafe<br><i>'The children ate mafe.'</i>                  | Neutral clause                    |
| b. | Xale yi <span style="border: 1px solid black;">da</span> =ñu lekk mafe.<br>child the.PL do.C=3PL eat    mafe<br><i>'The children ATE MAFE.'</i>                     | V/VP focus clause                 |
| c. | Xale yi <span style="border: 1px solid black;">a</span> (>yee) lekk mafe.<br>child the.PL C                eat    mafe<br><i>'It's the children that ate mafe.'</i> | Subject Exhaustive Identification |
| d. | Maafe <span style="border: 1px solid black;">la</span> xale yi      lekk.<br>mafe C    child the.PL eat<br><i>'It's mafe that the children ate.'</i>                | Object Exhaustive Identification  |
| e. | Tээрé bi- <span style="border: 1px solid black;">angi</span> ci biir      neeg bi.<br>book the.SG-C in stomach room the.SG<br><i>'The book is in the room.'</i>     | Locative clause                   |

- f. xaj bu Magatt bëgg  
 dog C Magatte like  
 ‘a dog that Magatte likes’ Object relative clause

Arguments for treating all the boxed elements in (4) as members of the same category come from their distribution, the positioning of pronominal clitics, and their position with respect to functional elements in the inflectional layer. Another argument for their high position in the clause is found when inspecting the properties of non-clitic subjects that surface to the left of sentence particles. This evidence is discussed in the next two subsections.

Finite indicative clauses with sentence particles shown in (4) fall into two types, which I call *V-raising* and *Wh-raising* clauses. In V-raising, a verbal element immediately precedes the sentence particle in CI, there is an obligatory clause-internal subject clitic, with an optional non-clitic subject in the left periphery (I shall argue in Spec,CIP). V-raising clauses therefore only have one specifier position in the C-Infl domain, and this position precedes CI. In Wh-raising, an XP is A'-moved to the specifier of the sentence particle, the verb does not raise to it, and there is a position for a non-clitic subject clause-internally. In other words, Wh-raising clauses have two specifier positions. Table 1 summarizes these characteristics of the two clause-types.

V-raising	Wh-raising
verb in CI	no verb in CI
lexical subject in Spec,CIP	A'-moved XP in Spec,CIP
subject below CI must be a clitic	subject below CI can be a non-clitic

Table 1: Syntactic characteristics of V-raising and Wh-raising clauses

V-raising clauses are given in (5). Elements that can raise/adjoin to CI are the main verb, in (5a), the verb *def* ‘do’ (5b), and the imperfective auxiliary *di* in (5c). I follow Church (1981) and consider Predicate Focus clauses to involve a type of *do*-support.<sup>2</sup> All clauses in (5) obligatorily contain a subject clitic right-adjacent to the sentence particle, and the non-clitic subject optionally to its left. (a’), (b’), and (c’) show that a non-clitic subject cannot be to the right of the sentence particle (with or without an accompanying subject clitic).

(5) *V-raising clauses*

- a. Xale yi lekk-na=**ñu** maafe.  
 child the.PL eat-C<sub>V</sub>=3PL mafe

<sup>2</sup>The sentence particle and the verb *def* ‘do’ are not transparently decomposable into two separate morphemes. Church (1981) credits Senghor (1963) for the insight that these clauses contain the verb ‘do’, relating the third singular form of the complementizer+subject-clitic complex, which is *dafa*, to *def* ‘do’. He notes that this link is clearer in some Wolof dialects, in which the 3rd singular form is *def-a*.

- Neutral
- 'The children ate mafe.'*
- a. ' \*Lekk-na=(**ñu**) xale yi mafe.  
eat-C<sub>V</sub>=(3PL) child the.PL mafe
- b. Xale yi da=**ñu** lekk mafe.  
child the.PL do.C<sub>V</sub>=3PL eat mafe
- Predicate Focus
- 'The children ATE mafe.'*
- b. ' \*Da=(**ñu**) xale yi lekk mafe.  
do.C<sub>V</sub>=3PL child the.PL eat mafe
- c. Xale yi di-na=**ñu** lekk mafe.  
child the.PL IPFV-C<sub>V</sub>=3PL eat mafe
- Neutral future
- 'The children will eat mafe.'*
- c. ' \*Di-na=(**ñu**) xale yi lekk mafe.  
IPFV-C<sub>V</sub>=3PL child the.PL eat mafe

No other element (e.g. an object, a locative) can be to the immediate left of the verb and the sentence particle, with the non-clitic or clitic subject to the right of it, as shown in (6), where the object occupies this position. Only subjects can be found there.<sup>3</sup>

(6) Only subjects can be to the immediate left of V+C in V-raising

- a. \*Maafe bëgg-na=ñu=(ko).  
maafe like-C<sub>V</sub>=3PL=3SG.OBJ  
*intended: 'They like mafe.'*
- b. \*Maafe bëgg-na=(ko) xale yi.  
maafe like-C<sub>V</sub>=3SG.OBJ child the.PL  
*intended: The children like mafe.'*

In V-raising clauses, therefore, the verb is in CI, and the position to the immediate left of V+CI is reserved exclusively for the non-clitic subject. A clitic subject is obligatory to the right of CI. Wolof pronominal clitics are right adjoined to C (Dunigan 1994; Martinović 2015a), therefore the subject clitic is not in a specifier of some head below the sentence particle. In §2.3 I offer more evidence for the claim that the subject to the left of CI is not in the structural subject position (i.e. a derived position to which the subject moves and where it obtains nominative case, e.g. Spec,IP), but in a higher specifier in the left periphery, Spec,CIP.

In Wh-raising clauses—Subject and Non-subject Exhaustive Identification clauses, questions, and relative clauses—the non-clitic and the clitic subject are in complementary distribution below CI.<sup>4</sup> In Non-subject extraction, the lexical subject and the pronominal one

<sup>3</sup>Any element in the clause can be topicalized, so the example in (6a) is grammatical if *maafe* is a topic, in which case it is separated from the rest of the clause with a pause and receives a topical interpretation (*As for mafe, they like it.*). The object clitic is obligatory in that case.

<sup>4</sup>Another clause-type that falls into the Wh-raising type are progressive clauses. Their syntax is more

are clause-internal, to the right of the sentence particle, as in (7). (7a) shows a clause with A'-movement of the object, in which the clause-internal subject can be either a clitic, or a non-clitic. (7b) shows this for an object relative clause. Examples in (a') and (b') show that the clitic and the non-clitic cannot co-occur to the right of the sentence particle.

(7) Object extraction

- a. Musaa<sub>i</sub> [la] = {ñu/xale yi} gis t<sub>i</sub>.  
 Moussa C<sub>Wh</sub>=3PL/child the.PL see  
*'It's Moussa that they/the children saw there.'*
- a.' \*Musaa<sub>i</sub> [la] = ñu xale yi gis t<sub>i</sub>.  
 Moussa C<sub>Wh</sub>=3PL child the.PL see
- b. jigéen<sub>i</sub> [ji] = {mu/Musaa} gis t<sub>i</sub>  
 woman C<sub>Wh</sub>=3SG/Moussa see  
*'the woman that he/Moussa saw.'*
- b.' \*jigéen<sub>i</sub> [ji] = mu Musaa gis t<sub>i</sub>  
 woman C<sub>Wh</sub>=3SG Moussa see

In subject A'-extraction, either the lexical subject or a subject pronoun is in the specifier of the sentence particle.<sup>5</sup> The subject clitic cannot occur to the right of CI in this case, as the subject has A'-moved. (8) shows this for subject Exhaustive Identification and a subject relative clause.

(8) Subject extraction

- a. {Xale yi<sub>i</sub>/ñu<sub>i</sub>} [a] t<sub>i</sub> dem.  
 child the.PL/3PL C<sub>Wh</sub> go  
*'It's the children/them who went.'*
- a.' \*xale yi<sub>i</sub> [a] = ñu t<sub>i</sub> dem.  
 child the.PL C<sub>Wh</sub>=3PL go
- b. xale<sub>i</sub> [bi] t<sub>i</sub> sopp Ayda  
 child C<sub>Wh</sub> love Ayda  
*'the child that loves Ayda'*
- b.' \*xale<sub>i</sub> [bi] = mu t<sub>i</sub> sopp Ayda  
 child C<sub>Wh</sub>=3SG love Ayda

complex: Martinović and Schwarzer 2018 argue that progressives in Wolof are bi-clausal, consisting of a locative clause and an infinitival complement. I do not discuss them here.

<sup>5</sup>Wolof distinguishes between two series of pronouns, akin to the strong vs. weak/clitic distinction in Cardinaletti and Starke 1999, and their distribution differs, largely along the observations in C&S. Only a strong pronoun can occur in the left periphery. Pronouns in the specifier of the sentence particle in Wh-raising clauses are strong pronouns, but they are phonologically reduced if they are the extracted subject, and in most persons appear identical to clitics. See Martinović 2015a for details.

The difference between V-raising and Wh-raising clauses is clear. In V-raising, the non-clitic subject and the subject clitic are on the opposite sides of the sentence particle, and can co-occur, with the clitic being obligatory. There is only one specifier position, preceding the sentence particle. In Wh-raising, the lexical and the pronominal subject are either in complementary distribution clause-internally (to the right of the sentence particle), or in the specifier of the sentence particle, in which case a subject clitic cannot occur to its right. There are two specifier positions, one for the A'-moved element, and the other for the subject. This distribution of subject clitics precludes an analysis in which they are verbal agreement, since we would have to contend with the obligatory absence of agreement in all but V-raising clauses (c.f. Zribi-Hertz and Diagne 2002). A V-raising and a Wh-raising example illustrating once more the distribution of the clitic and non-clitic subjects are in (9)-(10).

- |   |  |
|---|--|
| <p>(9) <u>V-raising</u><br/> <b>Xale yi</b>      dem-[na]=ñu.<br/> child the.PL go-C<sub>V</sub>=3PL<br/> <i>'The children left.'</i></p> | <p>(10) <u>Wh-raising</u><br/> Tëy [la] {<b>xale yi/ñu</b>}      dem.<br/> today C<sub>Wh</sub> child the.PL/3PL go<br/> <i>'It's today that the children left.'</i></p> |
|---|--|

I shall argue that Wolof subjects cannot stay in-situ, but must move to be case-licensed. A non-clitic subject cannot be found to the right of the sentence particle in V-raising due to the fact that there is no head that could host it in its specifier, because the properties of C and I (which I here take to host the subject in its specifier) are bundled on one head, CI, and this is not a position where the subject can receive nominative case. Wolof clitics, on the other hand, independently move to adjoin to CI; I propose that they can receive case in this position. They are therefore the only kind of subject eligible to occur in V-raising clauses. In Wh-raising clauses, on the other hand, the properties of C and I are split between two heads, creating another specifier position in which a non-clitic subject can be licensed. The details of the proposal are worked out in §3.

In the remainder of this section, I present evidence for the following claims I made: (i) that sentence particles all occupy the same position, and (ii) that non-clitic subjects to the left of sentence particles in V-raising are not canonical subjects.

## 2.2 *The position of sentence particles and clause-internal subjects*

This subsection discusses evidence that sentence particles are all hosted by one head, and that this head is at the edge of the clause, with elements to its left being in the left periphery.

Dunigan (1994) notes that all sentence particles are in complementary distribution with one another; it is impossible to have more than one in a clause, as shown in (11).

- (11) Sentence particles are in complementary distribution
- |  |                                |
|--|--------------------------------|
| <p>a. *Xale yi      [a] lekk-[na]=(ñu) maafe.<br/> child the.PL C eat-C=3PL      maafe</p> | <p>Subject focus + Neutral</p> |
|--|--------------------------------|



- b. \*Maafe [la] [da]=(ma) lekk-[na]=(a).      Object focus + V/VP focus + Neutral  
 maafe C    do.C=1SG eat-C=1PL

The position that sentences particles occupy is a target for cliticization. Wolof has Wackernagel-like clitics, that cluster together in finite indicative clauses, and they do so to the right of the sentence particle, regardless of the position of other elements in the clause, as in (12). Examples in which the subject or the object clitic is not to the right of C are those in which these elements have been A'-extracted.

(12) Clitics cluster to the right of sentence particles

- a. (Xale yi)    lekk=[na]=ñu=ko=fa.  
 child the.PL eat=C=3PL=3SG.OBJ=LOC  
 'The children/they ate it there.'
- b. (Xale yi)    [da]=ñu=ko=fa                      lekk.  
 child the.PL do.C=3PL=3SG.OBJ=LOC eat  
 'The children/they ATE it there.'
- c. Xale yi    [a]=ko=fa                      lekk  
 child the.PL C=3SG.OBJ=LOC eat  
 'It's the children that ate it there.'
- d. Maafe [la]=ñu=fa    lekk.  
 maafe C=3PL=LOC eat  
 'It's maafe that they ate there.'

In smaller structures, which do not contain sentence particles, clitics do not form clusters as in (12). For example, Wolof has clauses that do not contain any functional material above vP, such as tense, negation, or aspect. They are used in running narratives or proverbs, and their temporal reference depends on context (Sauvageot 1965; Church 1981; Dialo 1981; Robert 1991; Zribi-Hertz and Diagne 2002). Clitics occur in those clauses, but they do not all cluster in one position; the subject clitic precedes the verb, and other clitics follow it.

(13) Clitics do not cluster in clauses smaller than the CP

- a. **Ma** gis=ko=fa.  
 1SG see=3SG.OBJ=LOC  
 'I see it there.'
- b. \***Ma=ko=fa**                      gis  
 1SG=3SG.OBJ=LOC see

This shows that sentence particles occupy a particular syntactic position that clitic movement targets, and that this position is unavailable in reduced clauses.

More evidence for a high position of sentence particles comes from the fact that they and the clitics precede all other elements in the clause: the subject (in Wh-raising clauses,

which can contain a non-clitic subject), which must precede any verbal element (the aspectual auxiliary *di* or the main verb), which in turn must precede low adverbs. Additionally, the subject surfaces higher than the verb with a negative suffix, and negation has independently been argued to be very high in Wolof (Torrence 2003; Martinović 2019). This serves to show that the subject is not in situ in such clauses, but must surface in a derived position. This is what I refer to as *the structural subject position*.

(14) *The position of C, clitics, the subject and the verb in Wh-raising*<sup>6</sup>

- a. Tëy      [la]=ko=fa      xale yi      (\*bu gaaw)      jàng-ul      bu gaaw.  
yesterday C=3SG.OBJ=LOC child the.PL (C be.quick) read-NEG C be.quick  
*'It's yesterday that the children didn't read it there quickly.'*
- b. Suba      [la]=ko=fa      xale yi      d(i)-ul      (\*bu gaaw)      jàng bu  
tomorrow C=3SG.OBJ=LOC child the.PL IPFV-NEG (C be.quick) read C  
gaaw.  
be.quick  
*'It's tomorrow that the children won't read it there quickly.'*

The same distribution of all elements, except for the non-clitic subject, which is not licensed clause-internally, is also found in V-raising clauses, as illustrated in (15).

(15) *Low adverbs are below all verbs in V-raising*

- Musaa daf-[a]=∅ d(i)-ul      (\*bu gaaw)      jàng bu gaaw      téere bi.  
Moussa do-C=3SG IPFV-NEG (C be.quick) read C be.quick book the.SG  
*'Moussa isn't reading the book quickly.'*

Finally, I present evidence that sentence particles are higher than tense. In (16a) and (16b), where no verbal element raises to the sentence particle, negation and tense are affixed to the verb. When the verb raises to the sentence particle, it normally carries inflectional morphology with it, however, when negation is present, as in (16c), the past tense morpheme *oon* is stranded below C (Torrence 2003; Martinović 2019). This shows that the sentence particle is higher than tense, and is an argument for separating CI from T. Negation has been argued to be above tense in Wolof, in which case it intervenes between CI and T (Torrence 2005, 2012; Martinović 2015a, 2019).<sup>7</sup>

<sup>6</sup>Wolof does not have the category of adjectives, so adjectival and by extension adverbial modification usually take the form of a relative clause.

<sup>7</sup>A reviewer wonders if (some of) the sentence particles are in a lower head in the inflectional layer of the clause. Given that they are always higher than tense, and in most cases than all inflectional morphology, it is difficult to see which head this could be. Even if we posited a head above tense and below C to host sentence particles (for example, Mood), we would gain nothing in ways of explanatory power, but, as we shall see, we would have a hard time explaining some of the properties of subjects to the left of the sentence particle.

(16) Sentence particles are higher than negation and tense

- a. Xale yi    da=ñu    lekk-**ul-oon**    maafe.  
 child the.PL do.C=3PL eat-NEG-PST mafe  
*'The children didn't EAT mafe.'*
- b. Maafe la xale yi    lekk-**ul-oon**.  
 mafe    C    child the.PL eat-NEG-PST  
*'It's mafe that the children didn't eat.'*
- c. Xale yi    lekk-**ul-**∅=ñu    **woon**    maafe.  
 child the.PL eat-NEG-C=3PL PST    mafe  
*'The children didn't eat mafe.'*

The relevance of (16c) is the following: the tense morpheme is not affixed onto the verb, but skipped over by the moving head, in apparent violation of the Head Movement Constraint (Travis 1984). I therefore argue in Martinović 2019 that (*w*)oon is a phrasal morpheme in Spec,TP, and not a T head. As I claim that the head hosting the sentence particle (C), and the head hosting the subject in its specifier (I) are bundled together in V-raising clauses, (16c) excludes T from that bundle. Since negation is independently argued to be higher than tense, and the subject surfaces higher than both, shown in (16b), I place the subject in a specifier of a head separate from T. I discuss my view of the overall clausal architecture in section 5 and how the proposal here can still capture the relationship traditionally claimed to exist between C and T.

A final note on my choice to treat sentence particles as complementizers. In a split-CP structure proposed by Rizzi (1997), CI would be closest to Fin, which is how Zribi-Hertz and Diagne (2002) and Torrence (2003) label the V-raising particle *na*. Given that *na* in Wolof is incompatible with particles that occur in A'-movement (questions, subject and non-subject focus, and relative clauses), which are traditionally considered to be complementizers, I label this head as C. The higher embedding complementizer *ni* would be akin to Rizzi's Force, with TopP between *ni* and sentence particles. In this sense, Wolof is similar to Korean, which distinguishes between mood markers signaling clause type (statements, questions, etc.), obligatory in every clause, and a subordinating particle, which introduces embedded clauses. Bhatt and Yoon (1992) propose that the category "Comp" be dissociated into two distinct categories—one that indicates clause-type, and one that indicates subordination—which some languages would conflate, and some keep separate, another instance of a non-cartographic and cartographic structure. Some sentence particles are indeed similar to mood markers: we could label *na* as indicative, *la* as interrogative, there are also sentence particles that occur in optative and imperative clauses that appear to be in the same position.<sup>8</sup> Sentence particles also involve the expression of focus – *la* for example occurs in questions but also Exhaustive Identification structures. Sentence particles therefore combine properties of mood and clause-typing markers. I choose to label this head as

<sup>8</sup>Optative and imperative clauses have a somewhat different syntax. I do not discuss them here, as they do not contribute directly to the topic of the paper.

C, as I argue that it marks the clausal boundary, and that the subject to its left behaves as if it were in the left periphery. This is the topic of the final part of this section.

### 2.3 Non-clitic subjects in V-raising

Part of my analysis of the obligatory occurrence of the subject clitic in V-raising clauses relies on demonstrating that the non-clitic subject to the left of CI is not in a structural subject position; i.e. that this subject does not satisfy whatever requirement exists for there to be a nominative subject in a finite clause. The subject clitic does, so it is the only available subject in V-raising clauses. The details of this proposal are worked out in section 3. In this section, I establish the position of the non-clitic subject in V-raising clauses.

A subject to the left of CI in V-raising clauses behaves as any other DP in the left periphery in that it must be resumed by a clitic. One possibility we need to eliminate is that all subjects to the left of CI are topics. Any DP can be left-dislocated in Wolof and receive topical interpretation (Russell 2006). Topicalized subjects can freely change order with other topics, as in the Wh-raising clauses in (17).

(17) Topics can change order in Wh-raising clauses; Russell 2006, 130

- a. Ceeb bi<sub>i</sub> [Maryam ag Xhadi]<sub>j</sub>, ñu<sub>j</sub>-a (>ñoo) ko<sub>i</sub> lekk.  
rice the.SG Maryam and Xhadi 3PL-C<sub>Wh</sub> 3SG.OBJ eat  
‘The rice<sub>i</sub>, [Maryam and Xhadi]<sub>j</sub>, it’s them<sub>j</sub> who ate it<sub>i</sub>.’
- b. [Maryam ag Xhadi]<sub>j</sub> ceeb bi<sub>i</sub> ñu<sub>j</sub>-a (> ñoo) ko<sub>i</sub> lekk  
Maryam and Xhadi rice the.SG 3PL-C<sub>Wh</sub> 3SG.OBJ eat  
‘[Maryam and Xhadi]<sub>j</sub>, the rice<sub>i</sub>, it’s them<sub>j</sub> who ate it<sub>i</sub>.’

In V-raising clauses, the same can happen – a subject in the left periphery can be topicalized, as shown in (18), where it can change order with the topicalized object DP.

(18) Topics can change order in V-raising clauses; Russell 2006, 130

- a. Ceeb bi<sub>j</sub> [Maryam ag Xhadi]<sub>i</sub> lekk-na=ñu<sub>i</sub>=ko<sub>j</sub>.  
rice the.SG Maryam and Xhadi eat-C<sub>V</sub>=3PL=3SG.OBJ  
‘The rice<sub>j</sub>, [Maryam and Xhadi]<sub>i</sub>, they<sub>i</sub> ate it<sub>j</sub>.’
- b. [Maryam ag Xhadi]<sub>i</sub> ceeb bi<sub>j</sub> lekk-na=ñu<sub>i</sub>=ko<sub>j</sub>.  
Maryam and Xhadi rice the.SG eat-C<sub>V</sub>=3PL=3SG.OBJ  
‘[Maryam and Xhadi]<sub>i</sub>, the rice<sub>j</sub>, they<sub>i</sub> ate it<sub>j</sub>.’

Topicalized DPs are usually followed by a pause, and must be felicitous under a topical interpretation. The same is not true of lexical subjects in V-raising structures. The sentence in (5a), for example, can be uttered in an out-of-the-blue context, and the DP *xale yi* ‘the children’ is not followed by a pause. A more convincing piece of evidence that there is a difference between pre-CI lexical subjects in V-raising clauses and topicalized DPs comes

from bare quantifiers, which by hypothesis cannot occupy the topic position (Rizzi 1986, 1997). This is true in Wolof: bare quantifiers cannot occur in positions which are definitely topics, preceding elements that A'-move to Spec,CIP:

(19) Bare quantifiers cannot precede A'-moved elements; Russell 2006, 134

\*Kenn<sub>i</sub> lan l-a=∅<sub>i</sub> jënd?  
 someone what l-C<sub>Wh</sub>=3SG buy  
 intended: “Someone, what did s/he buy?”

Russell (2006) shows that in Wolof bare quantifiers can appear as subjects to the left of CI, as in (20a), but not as subject topics, in (20b):

(20) Bare quantifiers can be to the left of CI in V-raising; Russell 2006, 134

- a. Kenn<sub>i</sub> gis na=∅<sub>i</sub> Maryam.  
 someone see C<sub>V</sub>=3SG Maryam  
 “Someone<sub>i</sub> saw Maryam.”
- b. \*Kenn<sub>i</sub> Maryam<sub>j</sub> gis na=∅<sub>i</sub>=ko<sub>j</sub>.  
 someone Maryam see C<sub>V</sub>=3SG=3SG.OBJ  
 intended: “Someone<sub>i</sub>, Maryam<sub>j</sub>, s/he<sub>i</sub> saw her<sub>j</sub>.”

The data suggest that there is a non-topical position for non-clitic subjects to the left of the sentence particle in V-raising clauses, and below TopP. I propose that this is the specifier of the CI head. One crucial difference between the subject position in V-raising clauses and the one in Wh-raising clauses is that the former one does not have to be occupied by an overt element. Clause internal subjects, on the other hand, can never be null.

(21) Only subjects to the left of CI can be null

- a. (Xale yi) lekk-na=ñu ceebujën.  
 (child the.PL) eat-C<sub>V</sub>=3PL ceebujën  
 ‘(The children)/They ate ceebujën.’
- b. Ceebujën la \*(xale yi/ñu) lekk.  
 ceebujën C<sub>Wh</sub> \*(child the.PL/3PL) eat  
 ‘It’s ceebujën that the children/they ate.’

Finally, the subject to the left of CI in V-raising clauses can be a non-clitic pronoun, which is not possible when the subject is to the right of C. Wolof has two sets of pronouns with different distributions, similar to strong and weak/clitic pronouns described by Cardinaletti and Starke (1999) (C&S). I use the terms *strong pronoun* and *weak/clitic pronoun* for convenience, without implying all the properties that C&S associate with the two pronoun types. In Wolof only strong pronouns can be topicalized, focused, coordinated,

and be complements of prepositions, as C&S note is the case in languages in their sample. They cannot occupy argument positions to the right of C, only weak pronouns/clitics can be found there (Martinović 2015a), both in finite clauses, and in clauses of reduced size. (22) shows a strong pronoun in the subject position to the left of C in a V-raising clause.

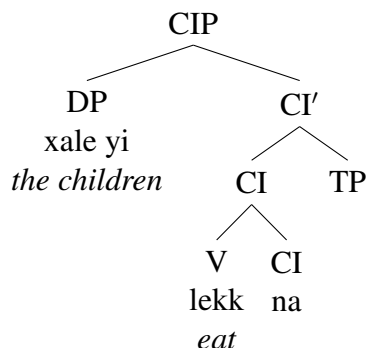
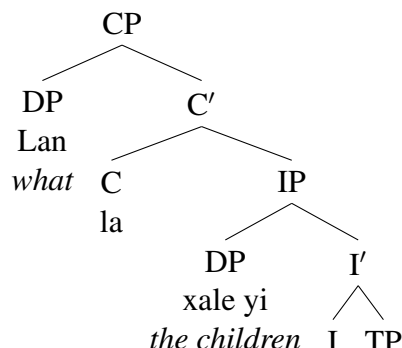
(22) Only subjects to the left of C can be strong pronouns

- a. Ñoom                      lekk-na=ñu ceebujën.  
       3PL.STR.PRON. eat-C<sub>V</sub>=3PL ceebujen  
       ‘They ate ceebujen.’
- b. \*Ceebujën la      ñoom                      lekk.  
       ceebujen C<sub>Wh</sub> 3PL.STR.PRON. eat  
       ‘It’s ceebujen that they ate.’

I argue in this paper that the non-topical subject position in V-raising clauses differs from the clause-internal subject position in Wh-raising clauses in that the former one is not a structural case position, while the latter one is. This will play an important role in explaining the obligatory presence of the subject clitic in V-raising clauses.

#### 2.4 Interim summary

In this section we saw data that point to a structural difference between V-raising and Wh-raising clauses in Wolof. The highest functional head in V-raising is doing double duty: it has a C-like property, in that it hosts the complementizer *na* (which belongs to the category of elements that have clause-typing properties), and an Infl-like property, in that it hosts the subject in its specifier. This subject, however, in certain ways behaves as if it were in the left periphery: it is optional, and it must be resumed by a clause-internal clitic. In Wh-raising clauses, there are two separate heads, a higher C-like one that hosts the *wh*-complementizer (Martinović 2013a, 2015a, 2017b) and a *wh*-word in its specifier, and a lower Infl-like one that can host a non-clitic subject in its specifier. The subject in Wh-raising clauses is not in situ in Spec,vP, as it precedes verbs that host high inflectional morphology (negation), and that are independently shown to be in a higher position, preceding low adverbs. The main claim of this paper is therefore that in Wolof the features of C and Infl are sometimes contained in one head (non-cartographic effects, in (23)), and other times split over two heads (cartographic effects, in (24)).

(23) V-raising(24) Wh-raising

How do we generate the two clause types? One simple solution would be to stipulate that C in V-raising clauses selects for a complement that does not contain a specifier position for the subject (e.g. a defective Infl), whereas C in Wh-raising clauses selects for a complement which does contain this position. I argue against this kind of an approach, both on conceptual and on empirical grounds. Selection is a powerful tool which can be employed to account for any kind of variation, and it is precisely for that reason that it should be reserved for idiosyncratic phenomena. This is not such a case, as I discuss in more detail in §5. More troublingly, in this case a selection-based analysis has no empirical support. There is nothing about V-raising clauses that would justify blocking a specifier position of a head that is present by, for example, proposing that this head is defective in some way. Such an account would therefore be descriptive, and not explanatory.

I take a different approach, and propose that the difference between V-raising and Wh-raising clauses stems from general clause-building mechanisms, which also suggests that the two structures are derivationally related. Specifically, I propose that C and Infl always start out bundled, and remain bundled if the derivation can converge (in this case, if all features of CI can be checked). Just in case not all features of CI can be checked, the feature bundle splits into two heads, resulting in new specifier positions. I take this to apply to all parts of the clause, not just C and T/Infl, which I discuss in more detail in §5.

The next two sections illustrate the derivation of the two clause types.

### 3 V-raising and unsplit CI

Together with section 4, this section develops the central argument of the paper: that the C-I link in Wolof is of a particular nature, namely, that the two heads traditionally called C and I in fact start out as a single head, which may remain compact in Wolof.

Here we take a close look at V-raising clauses. The data in §2 illustrate three crucial properties that differentiate them from Wh-raising clauses, repeated in Table 2. First, in V-raising clauses the verb is located in the highest head, which also hosts the sentence particle. Second, the optional lexical subject is to the left of the verb-C-clitic complex. And third, there is an obligatory clitic subject, right-adjacent to the sentence particle.

V-raising	Wh-raising
verb in CI	no verb in CI
non-clitic subject in Spec,CIP	A'-moved XP in Spec,CIP
subject below CI must be a clitic	subject below CI can be a non-clitic

Table 2: Syntactic characteristics of V-raising and Wh-raising clauses

The main reason for arguing that the structural subject position is missing in V-raising clauses is the inability of a non-clitic subject to occur below C, and the subject to the left of C having properties that distinguish it from clause-internal subjects: it can be null, it can be a strong pronoun, and, crucially, it must be doubled by a clause-internal clitic. The subject in Spec,CIP therefore does not appear to satisfy whatever requirement is placed on the subject of the clause, suggesting that it is in fact outside of it. The subject clitic, on the other hand, has been shown to not be in the structural subject position. I start this section by introducing the head-internal structure that I propose for CI, and then develop the analysis.

### 3.1 Head-internal feature geometry

First, I adopt the standard assumption that there are two types of features: (i) Probe-features that trigger syntactic operations (agreement and movement) because they must be checked by forming a relationship with an element that carries (ii) a matching Goal-feature ( $[F^+]$ ). The probe-features we are interested in obligatorily trigger movement. I represent them as  $[F^*]$ . I further propose that probe-features on a head are hierarchically organized, so that each feature is realized as a separate node, illustrated in (25).

$$(25) \quad [_H F1^* [_H F2^* [_H F3^* [_H H ] ] ] ]$$

All features are checked in a strict order, determined by the head-internal geometry. The structural conditions on feature checking are placed on the head, and not on the node where a particular feature is located. The head probes for elements with matching features, based on the accessibility condition in (26):

$$(26) \quad \text{\textit{Feature Accessibility Condition}}$$

An unchecked feature  $[F^*]$  on a head H is accessible to syntactic operations only if  $[F^*]$  is the highest unchecked feature in the hierarchy.

In addition to Probe-features, a head may, of course, also contain Goal-features. I propose that they are accessible at any point of the derivation to another head for feature-checking purposes. For concreteness, I place goal-features in the head's lowest terminal node.

An important part of the feature-system that I propose is that Probe-features on a head are hierarchically ordered. The hierarchical ordering of features is not a novel idea and has been explored in various works. Georgi and Müller (2007, 2010) and Müller (2010) assume that features form strictly ordered stacks on a head and must be *discharged* hierarchically,



by invoking the same type of accessibility restriction that I propose – only features that are on top of a feature stack are accessible. Manetta (2006, 2011) posits that features on a head are first grouped into bundles, and then those bundles form ordered stacks. Each bundle is valued in a single Probe-Goal interaction. The difference between these models and the one I propose is that I assume that features are hierarchically organized as terminal nodes of a complex head.<sup>9</sup> This has the advantage of affording a straightforward way for a part of the head to split off and reproject to a higher position, which is how I propose the C-I system is formed. We explore Head-Splitting in section 4.

### 3.2 *Unsplit CI head*

There are two types of V-raising clauses: those with a verb or the imperfective auxiliary in CI – Neutral sentences, and those with *do*-support in CI – Predicate focus sentences (see §2). I propose that the CI head in V-raising structures in Wolof has the following features:

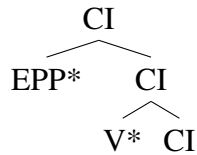
- (27) Features of CI in Wolof V-raising clauses
- (i) EPP\*
  - (ii) V\*

I use the EPP-feature in the standard way, to capture the observation that there is an overt subject, at some point in the derivation, in Spec,IP (Chomsky 1982).

[V\*] is a Probe-feature that I here hold responsible for verb raising to CI. In some analyses, especially of V2 languages, the feature that performs this function is a Tense feature (e.g. Den Besten 1989). I have briefly shown in §2, and argue extensively in Martinović 2019, that Tense is below CI in Wolof, and therefore could not trigger verb raising to CI. [V\*] has no explanatory power here; I use it simply to capture verb movement up the clausal spine.

The internal feature geometry of CI is represented in (28). I omit any other features that CI has (e.g. clause-typing features).

- (28) Feature geometry of CI in V-raising clauses



In the remainder of this section, I show how the hierarchical organization of CI's features and the system detailed in the previous subsection derive three properties of V-raising

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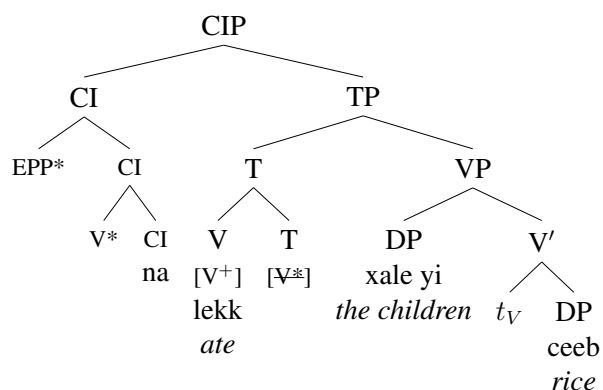
<sup>9</sup>Geometrical organization of features has been proposed, though in a more complex form, in Harley and Ritter 2002.

clauses: (i) a verb is located in the highest functional head, (ii) a non-clitic subject is in the specifier of this head, and (iii) a subject clitic obligatorily occurs to the right of this head. We will consider the derivation of Neutral clauses, but Predicate focus clauses are derived in the same way, the only difference being that [V\*] on CI is satisfied via the external merger of the verb *def* 'do', instead of the internal merger of the highest verbal head from the clause.

The structure of the V-raising clause in (29) when CI is merged is in (30). I place the subject in Spec,VP and omit any functional projections irrelevant for the analysis for simplicity. I use smaller font to distinguish the internal syntax of the CI head from the remainder of the clausal structure. I assume that the verb raises through all the heads of the inflectional layer to T, triggered by [V\*]. CI takes the TP as its complement.

- (29) Xale yi lekk-na=ñu ceeb.  
 child the.PL eat-C<sub>V</sub>=3PL rice  
*"The children ate rice."*

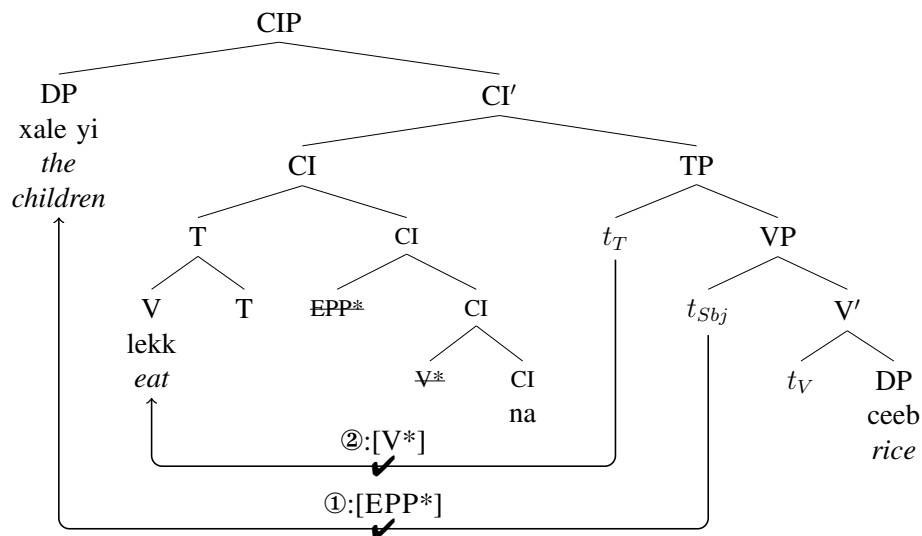
(30)



Probe-features on CI are checked in accordance with the *Feature Accessibility Condition* in (26). The subject *xale yi* 'the children' first moves to Spec,CIP to check [EPP\*]. The next accessible feature is [V\*] checked by the verb *lekk* which moves through CI. Note that, in this analysis, head movement and phrasal movement must be different, in that heads adjoin to heads and phrases move into their specifiers. The derivation is illustrated in (31).<sup>10</sup>

<sup>10</sup>The ordering of [EPP\*] and [V\*] is actually not crucial here; the opposite order would achieve the same result. I order [EPP\*] before [V\*] because the [Wh\*] feature will necessarily have to be ordered after [EPP\*], and there are reasons to believe that [V\*] and [Wh\*] are two sides of the same feature. See Martinović 2015a for a preliminary exploration of this idea.

(31)



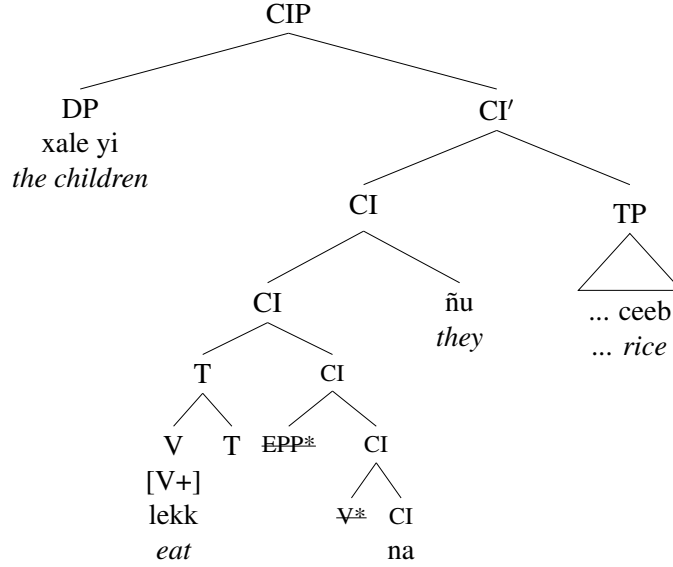
The internal feature geometry of the CI head and the hierarchical valuation of features explains why CI in V-raising clauses is not split, deriving the fact that a non-clitic subject does not occur below CI in these sentences. (31) is, however, not the final structure of a neutral V-raising clause: there must be a subject clitic right-adjacent to the CI head, obligatorily co-indexed with the DP in Spec,CIP, as in (32).

(32) Neutral V-raising clause has an obligatory subject clitic

Xale yi<sub>i</sub> lekk-na=\*(ñu<sub>i</sub>) ceeb bi.  
 child the.PL eat-C<sub>V</sub>=3PL rice the.SG  
 “The children ate the rice.”

I follow Dunigan (1994) and propose that Wolof clitics right-adjoin to the highest head in the extended projection of the verb (see also Martinović 2020). The final structure of (32) is given in (33).

(33)



The important observation here is that any DP in the left periphery (be it a subject in Spec,CIP, or a topicalized DP), except DPs A'-moved to Spec,CP, must be resumed by a clitic. I here propose one possible analysis, but nothing hinges on this particular formalization of this observation.<sup>11</sup>

Suppose that Spec,CIP, being a left-peripheral position, is not a position where the subject can get nominative case. This is supported by the fact that it can be occupied by strong pronouns, which can never be found in structural case positions. Suppose also that something like the Inverse Case Filter is active in Wolof (e.g. Fukui and Speas 1986; Bošković 1997, 2002; Grohmann et al. 2000; Epstein and Seely 2006).<sup>12</sup>

(34) Inverse Case Filter

Case-assigning heads must discharge their Case in the course of the derivation.

Given that a non-clitic DP cannot be assigned nominative case in V-raising clauses, I propose that the derivation in which only a non-clitic subject is generated in Spec,vP crashes.

The alternative available in Wolof is for the clause-internal subject to be a clitic. I propose that a clitic is a suitable subject because it independently moves to a position in which it can get nominative case. Since the clitics right-adjoin to CI, and nothing ever

<sup>11</sup>Wolof is in this respect not really that different from English. In English (and many other languages) we accept that there *must be a clause-internal subject in a particular position*. We capture this by the EPP, but we do not really understand this requirement. As in Wolof, any subject in the left periphery in English, aside from those A'-moved to Spec,CP (again, as in Wolof), must be resumed by a pronoun inside the clause. The only difference is that in Wolof the placement of the subject in the left periphery and its resumption is obligatory.

<sup>12</sup>In previous versions of this work (Martinović 2015a, 2017a), I proposed a Nominative Case Condition, which would require some DP to have nominative case inside the clause. I thank an anonymous reviewer for pointing out that the Inverse Case Filter is a better fit here.

intervenes between CI and the subject clitic, I propose that nominative case in Wolof is assigned by CI to an element it immediately c-commands. It has often been observed that pronominal subjects must be adjacent to C, either due to an adjacency condition on case assignment (Stowell 1981) or to a requirement that pronominal clitics must cliticize to their case assigners (Borer 1984). For some such cases it has been proposed that the subject clitic is incorporated into C and obtains case in this way (e.g. Baker 1988; Rizzi and Roberts 1989/1996). This is also plausible for Wolof, as subjects clitics often form portmanteau morphemes with sentence particles, whereas other clitics do not, even in clauses which do not contain subject clitics. Whatever the right analysis of how the clitic obtains case, it is cross-linguistically common for pronouns to be viable subjects when non-pronominal DPs are not.

If C assigns case to an element it c-commands, then why can an in-situ subject not get nominative case? Recall that I have argued that T is separate from IP (see also Marti-nović 2019), so at least T would always intervene between C and Spec,vP, preventing the assignment of nominative case to an in-situ subject.<sup>13</sup>

Given that it is standardly T that is associated with nominative case assignment, a few words are in order on the proposal that this duty here rests with C. The assignment of nominative case by C has featured prominently in the literature on V2 (and V-to-C in general) (e.g. Koopman 1984; Platzack 1986a,b; Sportiche 1988; Rizzi and Roberts 1989/1996; Holmberg and Platzack 1988, 1990; Koopman and Sportiche 1991; Roberts 1993; Vikner 1995), and is often seen as related to verb movement to C (though not necessarily as its cause, but as a consequence of the same requirement that causes V-to-C). It has also been observed that in cases of V-to-C, C often contains inflectional features usually related to T/Agr/I (e.g. in Bavarian and West Flemish; Bayer 1984a,b). Interestingly, in some cases in which the verb moves to C, the only subject that can surface below C is a pronominal one, as in these examples from French:<sup>14</sup>

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<sup>13</sup>There may be empirical evidence to support this proposal. Optative clauses in Wolof also contain a sentence particle, which happens to have the same form as the one in V-raising clauses, *na*. It behaves as other sentence particles, in that it is in complementary distribution with them, and clitics cluster to its right. Unlike in V-raising clauses, however, the verb does not move to it, and there is a position for the lexical subject to its right, as in (i):

- (i) Na xale yi      xaar.  
       C   child the.PL wait  
       ‘Let the children wait.’

Optative clauses cannot contain the functional elements that by hypothesis occur between C and *v* – tense, aspect, and negation. It is possible therefore that in those cases CI takes *v*P as a complement, meaning that the subject in Spec,*v*P would be immediately c-commanded by CI and could be assigned nominative case in situ. More research is needed to confirm this.

<sup>14</sup>French also has so-called complex inversion, in which a non-pronominal DP subject can occur before the verb:

- (35) a. Est-il parti?  
is-he left  
'Has he left?'
- b. \*Est Jean parti?  
is John left

Rizzi and Roberts (1989/1996) attribute the ungrammaticality of a post-verbal subject in (35b) to the movement of I to C. They propose, following Sportiche (1988) and Koopman and Sportiche (1991), that case can be assigned either under government or under Spec-Head agreement, and that the choice is a parametric one (though one language may choose both). In French, they argue, nominative case is assigned in a Spec-Head configuration by I, and movement of I-to-C destroys the context for the assignment of nominative case. Pronouns undergo incorporation into C, and can get case that way (following Baker 1988). In Germanic, on the other hand, nominative case can also be assigned by I under government, which is why a post-verbal non-pronominal subject in cases of verb movement to C is possible.

Whatever the right analysis of V-to-C is, the connection between it and the kind of subject that is allowed to occur below C is well documented. I attribute the restriction to pronominal subjects to the right of C to two factors: the Inverse Case Filter, which requires CI to discharge nominative case, and the direction of nominative case assignment by CI, to an element it immediately c-commands. As pointed out, nothing hinges on this part of the analysis. What is relevant for us is that a position for a non-clitic subject to the right of C is not available in V-raising clauses, which is cross-linguistically not uncommon.

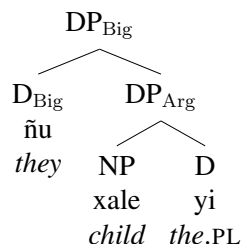
What remains now is to say something about the relationship between the clitic and the non-clitic subject, capturing the fact that a non-subject DP cannot occupy Spec,CIP. The fact that only a subject DP can occupy Spec,CIP is straightforwardly captured if the subject moves there (and is not base-generated), by a principle such as Attract Closest (e.g. Relativized Minimality: Rizzi 1990, 2001, or Minimal Link Condition: Chomsky 1995, 2000), given that the subject is the highest DP. This means that, for a derivation to successfully converge, both the clitic and the non-clitic subject need to be generated in the structure, in a type of a Clitic Left Dislocation structure. For concreteness, I propose that a clitic is generated as a constituent with a doubled argument in a *big*-DP as in (36) (Uriagereka 1995; Cecchetto 2000; Belletti 2005; Franks and Rudin 2005; van Craenenbroeck and van Koppen 2008; Arregi and Nevins 2012). I place clitics in the head of D<sub>Big</sub>, which takes the doubled argument as its complement. The doubled argument can be any DP or a strong pronoun, one of which is a *pro*. This explains why only a subject to the left of the sentence particle can be phonologically null: strong pronouns cannot occur in argument positions.<sup>15</sup>

- 
- (i) Quel livre Jean a-t-il lu?  
which book Jean has-*t*-he read  
'Which book has Jean read?'

This configuration only occurs in interrogatives, where the verb, by hypothesis, moves to C. In Wolof, the verb moves to C only in declaratives, but otherwise, the two phenomena seem to be identical.

<sup>15</sup>A reviewer suggests that it is counterintuitive to propose that a strong pronoun can be null; after all, null pronouns cannot be focused or coordinated, and these are positions in which only strong pronouns occur

(36)



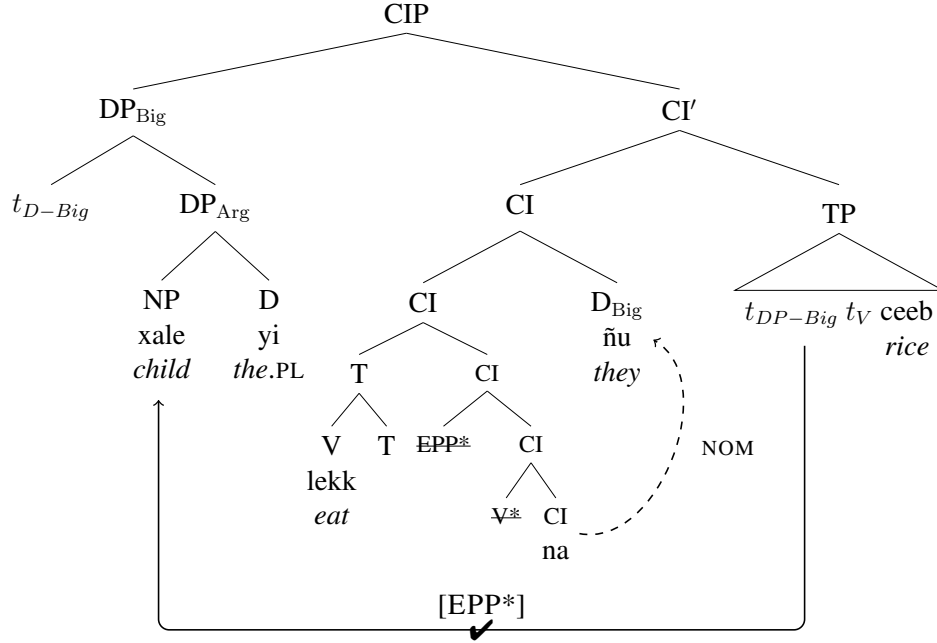
In Wolof, as in some other languages with Clitic Left Dislocation (but not Clitic Doubling, e.g. Italian), the clitic and  $DP_{Arg}$  cannot both stay clause-internal (inside the same CIP). The clitic has its own placement requirements, and it moves to right-adjoin to CI. I discuss the movement and placement of clitics in more detail in the Appendix. If there is an overt argument inside the *big*-DP, it must be to the left of CI. In V-raising clauses, this position is Spec,CIP. I propose that  $DP_{Arg}$  moves there to check [EPP\*]. Since only a subject can occupy Spec,CIP (the object, for example, cannot move there), it follows that the subject in V-raising clauses is always a *big*-DP, with it being the highest DP and thus moving to Spec,CIP.<sup>16</sup> The clitic moves out first, followed by remnant movement of the *big*-DP to Spec,CIP. The final structure of the V-raising clause is in (37). The clitic is adjoined to CI, where it can be assigned nominative case by CI.

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in Wolof. I have already mentioned that Wolof pronouns do not behave as pronouns in Cardinaletti and Starke (1999) – in particular, strong pronouns in Wolof cannot occupy argument positions, only clitics/weak pronouns can. It is therefore not inconceivable that they also have other properties that are not found in C&S's sample. Since Wolof otherwise does not allow subject *pro*-drop, and the only allowed null subject is the one in Spec,CIP in V-raising clauses, I believe it is justifiable to propose that it is a phonologically null pronoun. Its inability to occur in focus or coordination would have to be regulated by an unrelated principle, for example some version of Recoverability. After all, *pro* does not have an unconstrained distribution and in general cannot be focused or coordinated.

<sup>16</sup>An alternative to a *big*-DP would be to say that the DP in Spec,CIP is base-generated there, and that only a clitic clause-internal subject leads to a successful derivation, for reasons discussed above. We would also have to place a condition on the DP in Spec,CIP, which would require it to bind the highest clitic in the clause, ensuring that the element in Spec,CIP is always the subject. It is this last stipulation that seems too ad hoc to me and why I choose the *big*-DP approach.

(37)



In this section I investigated V-raising sentences in Wolof, which exhibit three properties not found in Wh-raising sentences. First, the verb is located in the head that hosts the sentence particle, a complementizer-like element situated in a C-like head. Second, the non-clitic subject cannot be below the sentence particle, but is located to the left of the verb-C complex. And third, an obligatory pronominal subject clitic occurs clause-internally, immediately to the right of the sentence particle. I argue that V-raising clauses contain one high functional head, CI, combining features commonly distributed between C and I. Assuming a difference between head movement and phrasal movement, all of CI's features can be checked on CI, via verb raising to C or *do*-support in C, and subject movement to Spec,CIP. The obligatory occurrence of a pronominal subject clitic is the result of the fact that the subject in the left periphery is doubled by a clause-internal clitic. I have proposed one possible explanation as to why V-raising clauses require doubling: the Inverse Case Filter requires that nominative case be discharged, and due to the mechanics of nominative case assignment (it is assigned by CI to a nominal it immediately c-commands), this cannot be the lexical subject that ends up in Spec,CIP. Therefore, a derivation in which only a lexical subject is generated in Spec,vP crashes. If, however, a *big*-DP is generated in Spec,vP, containing the clitic and the non-clitic subject, both [EPP\*] and the Inverse Case Filter can be satisfied – the clitic adjoins to CI where it absorbs nominative case, and the doubled argument moves to Spec,CIP to check [EPP\*].

In the following section, we explore Wh-raising clauses in which the CI head does not stay compact, but splits into two positions, yielding the traditional C-I separation.



## 4 Head-splitting in Wh-raising clauses

Section 3 shows how a particular implementation of the insight that the complementizer layer and the inflectional layer share a deep connection, in an analysis according to which they start out as a single head, explains syntactic properties of V-raising clauses, in which there is no apparent separation of the two heads, and all their properties are bundled in one functional projection. In this section, I show that Wh-raising clauses, where the traditional division of labor between the two heads is observed, can be derived from an initially bundled structure. The crucial difference between the two clause types is in the availability of a subject position below the sentence particle, i.e. the CI head. I argue that this position is available in Wh-raising clauses because the CI head splits, creating an additional specifier. Crucially, this analysis assumes a derivational relationship between cartographic and non-cartographic structures, doing away with the need to parametrize this type of variation. I start this section by introducing the Head-Splitting mechanism, and then show how it derives Wh-raising clauses.

### 4.1 Head-splitting

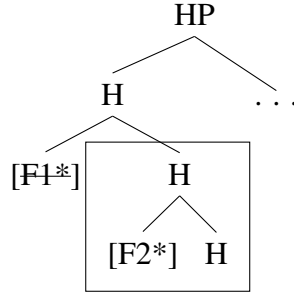
In this section, I lay out the mechanism that derives the cartographic Wh-raising clause-type, where the features of CI are distributed over two heads. I propose that the splitting of features occurs in cases of feature-checking failure, e.g. due to the goal not being in the probe's c-command domain or due to the unavailability of a landing position for the movement of the goal. In such a case, the part of the head containing this feature's node may form a new, higher head, creating new c-command relations and a new specifier position, yielding what we traditionally observe as C and Infl separation.

I propose that Head-Splitting may apply in the building of a structure as defined in (38):

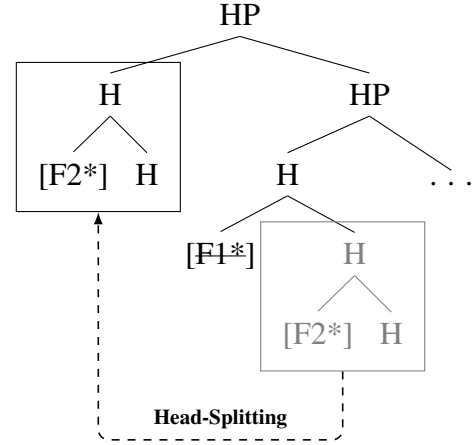
- (38) Head-Splitting  
The smallest projection of the head H that dominates all unchecked features splits off and adjoins to HP.

The trees in (39) and (40) illustrate the hierarchical feature organization on the head H, and the splitting mechanism. In (39), [F1\*] is checked first by agreement with, and movement of, some element in H's c-command domain (not shown). When the turn comes for [F2\*] to be checked, this fails. Another possible derivation is for [F2\*] and the node immediately dominating it to split off and remerge above H, thus creating a new head.

(39)



(40)



Head-splitting is a type of head reprojection (e.g. Pesetsky 1985; Ackema et al. 1993; Koenenman 2000; Haider 2000, 2005; Bhatt 2002; Hornstein and Uriagereka 2002; Fanselow 2003; Surányi 2005; Georgi and Müller 2010). Reprojection provides a natural way of deriving Head-Splitting, if we allow for only parts of heads to reproject – those that carry unchecked features. This is the novelty of my approach, made possible by the geometrical organization of a head’s Probe-features.

#### 4.2 Non-subject extraction

Wh-raising clauses include *wh*-questions, structures in which a DP is Exhaustively Identified, and relative clauses. We will limit our discussion to *wh*-questions in this paper, but the analysis extends to all A'-movement constructions.<sup>17</sup>

The feature structure of CI in Wh-raising clauses has an additional feature-present: [Wh\*]. I omit [V\*] here; I address the reasons for this after presenting the analysis.

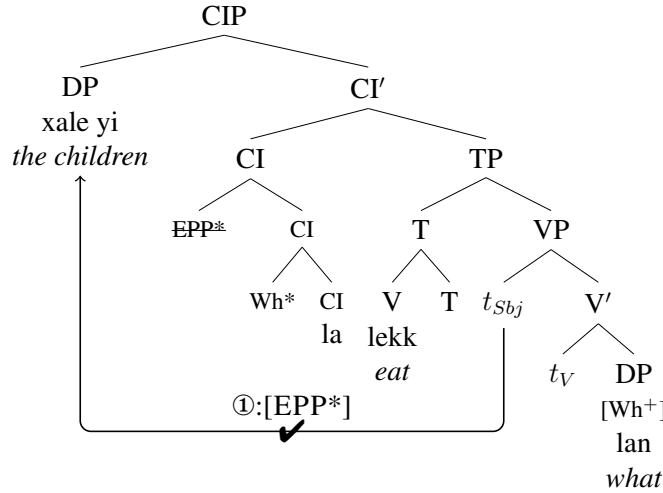
- (41) Feature geometry of CI in Wh-raising clauses  
 [CI EPP\* [CI Wh\* CI ] ]

We start with non-subject extraction. The Wh-raising clause in (42) has the structure in (43) after the subject moves to check [EPP\*].

- (42) Lan la xale yi lekk?  
 what C<sub>Wh</sub> child the.PL eat  
 “What did the children eat?”

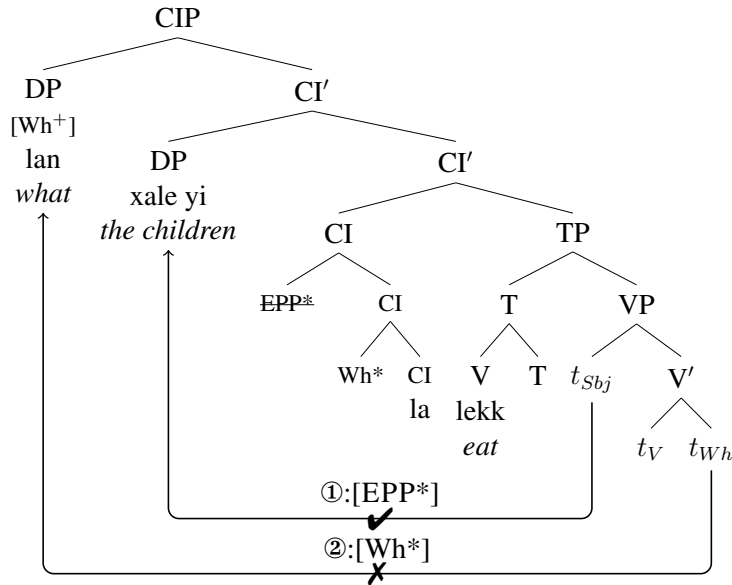
<sup>17</sup>There are two types of *wh*-questions in Wolof, which on the surface appear to be different. In Martinović 2017b I argue that all A'-movement constructions in Wolof have the same syntax, and that their surface appearance is the result of postsyntactic processes.

(43)



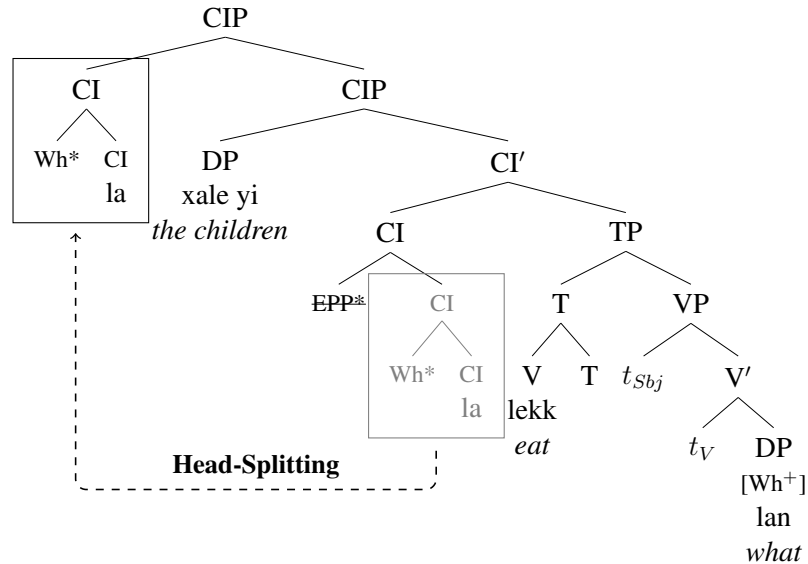
The next feature to be checked is [Wh\*], requiring a DP with a Wh-feature to move to Spec,CIP. This, however, is an illicit construction; an object *wh*-question can have neither the form in (44), nor one in which the *wh*-phrase tucks in between the subject and CI (Richards 1997, 1999). I take this to mean that two specifiers to CI in Wolof are disallowed.

(44) \*



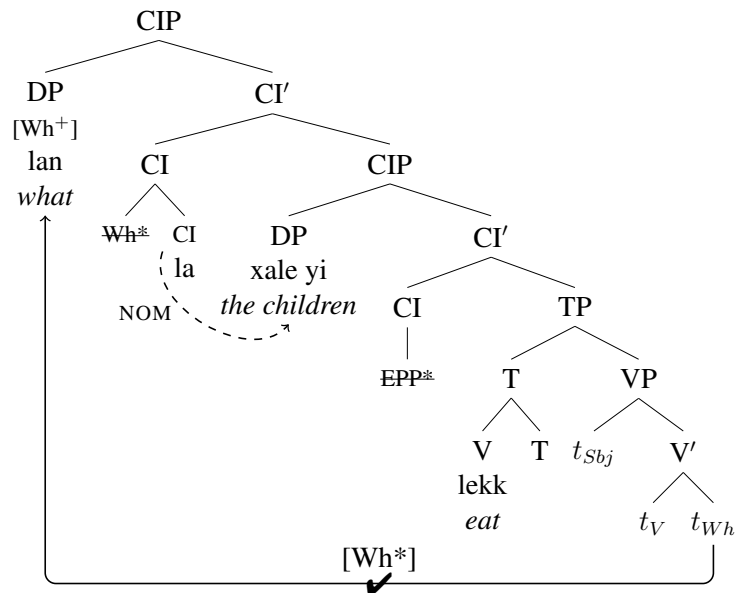
I propose that there is another way to derive the desired structure, by employing Head-Splitting, defined in (38). In the present example, the node dominating [Wh\*] splits off, and remerges in a higher position, thus forming a new head, as in (45).

(45)



[Wh\*] probes from its new position, and can be checked by the movement of the object *wh*-phrase *lan*:

(46)



I propose in the previous section that the clause-internal subject in V-raising clauses cannot be a non-clitic subject, as it is never in a position in which can be assigned nominative case. I relate this to the fact that a position for the subject immediately below CI does not exist. If this analysis is on the right track, then we can understand why a non-clitic subject is possible below the sentence particle in Wh-raising clauses. As can be seen in

(46), when part of the CI head splits off and remerges by adjoining to CIP, it now locally c-commands the subject DP, located in Spec,CIP. Under my assumption that nominative case is assigned in precisely this configuration, the subject DP can now receive it. This presupposes that the case-assigning property of CI is contained in the newly formed higher head. We can imagine that it is part of other (valued) features that also need to be part of this head, such as clause-typing features, which I proposed are contained in its lowest terminal node.

Recall that I omitted [V\*] from this derivation. One reason for this is that we cannot tell exactly where the verb is located in these constructions. There would be no difference if it moved to the lower CI head, just as in V-raising clauses, triggered by [V\*], and after head-splitting ended up being lower than the sentence particle. No element can come between any of the heads at the left edge of the clause (such as a high adverb), so we could not differentiate between an element in the lower CI head and an element in T. There is, however, a more convincing argument to propose that [Wh\*] and [V\*] are in complementary distribution, more specifically, that they are two sides of the same feature. Clauses with nominal predicates in Wolof that do not contain an overt copula require that the nominal predicate A'-move to Spec,CIP (see Appendix). In other words, a predicate, be it verbal or nominal, always moves to the CI domain, making it plausible that one and the same type of feature triggers verb movement and A'-movement in a language like Wolof. For reasons of space I do not address this interesting correlation here, but see Wedgwood (2003, 2005); É. Kiss (2006); Martinović (2015a); Klecha and Martinović (2015), for some preliminary ideas on the connection between A'-movement and predication in discourse-configurational languages such as Wolof and Hungarian.

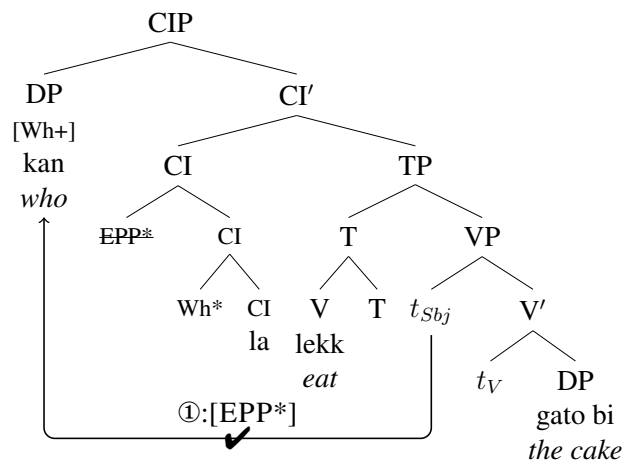
There is a worry that Head-Splitting as it is presented here necessarily involves some type of look-ahead, because an attempt to check [Wh\*] must first be made, and be filtered out by the ban on two specifiers. Head-Splitting would then be a last-resort, repair mechanism, which would entail undoing the illicit *wh*-movement step. One way to get around this would be to allow Head-Splitting to apply at any point in the derivation, meaning that every feature may split off and reproject. Derivations containing unwarranted instances of Head-Splitting (i.e. those that are not licensed by a failure in the derivation), would then be filtered out by a general Economy condition, favoring phrase markers that check as many features as possible in the smallest span of structure, instead of forcing vacuous splitting.

### 4.3 Subject extraction

Next, we look at an example of subject extraction, in (47). The derivation proceeds as for non-subject extraction up to the checking of [Wh\*]. The derivation with the subject moved to Spec,CIP to check [EPP\*] is given in (48).

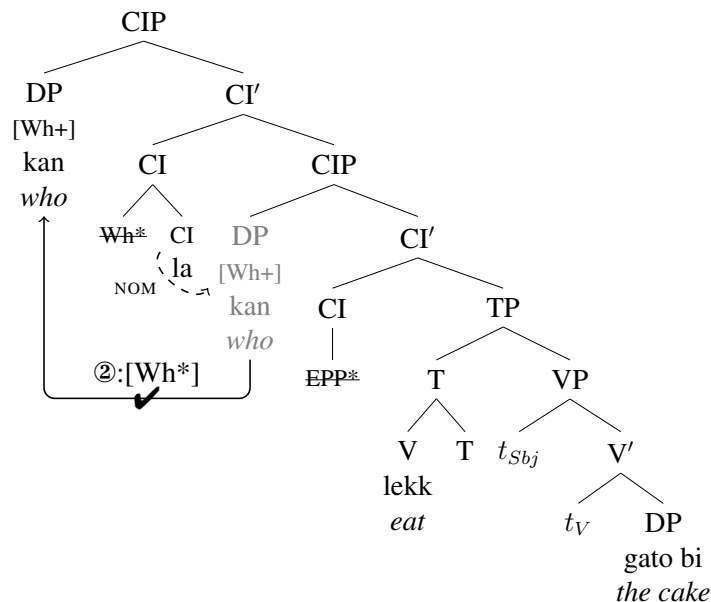
- (47) Kan a lekk gato bi?  
       who C<sub>Wh</sub> eat cake the.SG  
       ‘Who ate the cake?’

(48)



The next feature that probes is [Wh\*], but there is no goal in its c-command domain, given that the subject is already in Spec,CIP. The option to split the CI head is available, creating a new c-command domain that now contains the subject *wh*-phrase. The splitting also makes it possible for the subject to receive nominative case, allowing for clauses with subject A'-movement to have non-clitic subjects. Case assignment has to happen before subject A'-movement to the higher Spec,CIP. The final structure of (47) is in (49).

(49)



The two newly formed heads have properties traditionally associated with T/Infl (hosting the subject), and with C (hosting the A'-moved element). I label both heads as CI to make clear their derivational relationship, but this is just for notational convenience; I assume that the labels of the two heads are determined by the features they contain.

A final note on clitic subjects in Wh-raising clauses is in order. Recall from §2 that these sentences can have a clitic subject instead of a lexical subject, and of course, it is also possible to topicalize and resume such a subject (and any other DP). What is not possible is to resume a DP that A'-moves to Spec,CP. This is generally the case in Clitic Left Dislocation (e.g. Cinque 1997), and is something that any analysis of the phenomenon has to contend with.<sup>18</sup> With respect to my proposal on how clitic doubling/left dislocation in Wolof work, this means that, if a *big*-DP is generated in subject position, the doubled argument cannot carry a Wh-feature. I have nothing to say about this restriction here.

In this section, I have argued that Wh-raising clauses in Wolof have a split CI head, resulting in a structure with the traditional distinction between a higher head (C-like), hosting a *wh*-element, and a lower head (T/Infl-like), with the structural subject in its specifier. This accounts for the key difference between V-raising and Wh-raising clauses – the obligatory clitic clause-internal subject in V-raising clauses, due to the fact that there is no position in which a non-clitic subject can get nominative case (while a pronoun can do so by adjoining to CI), and the availability of a clause-internal non-pronominal subject in Wh-raising, due to the fact that CI splits, and gets into a position from which it can assign case to the subject in the specifier of the lower CI. I proposed Head-Splitting to be the result of one of two situations that occur in the course of the derivation. In subject extraction clauses, at the moment when [Wh\*] searches for an element with the Wh-feature in its c-command domain, the subject DP is already located in Spec,CIP, and is therefore not visible to CI. Head-splitting creates a new c-command domain, and [Wh\*] can now find the subject DP. In non-subject extraction, because the subject first moves to Spec,CIP to check [EPP\*], and under the hypothesis that CI allows for only one specifier position, the object with the Wh-feature has nowhere to move to. [Wh\*] can again not be checked, so the derivation with Head-Splitting, which has another specifier position, is the one that does not crash.

## 5 Discussion and Implications

Phenomena like the one discussed in Wolof are well known from other languages, though they are often more obvious in cross-linguistic comparison than within one and the same language, and more commonly noticed in the inflectional layer of the clause. Bobaljik and Thráinsson (1998), for example, note that Icelandic appears to have one subject position more (and, therefore, an additional functional head) in the inflectional layer compared to Norwegian, which they attribute to the Split-IP parameter. More interesting for us are languages which never seem to have separate A- and A'-positions.<sup>19</sup> This has been claimed

<sup>18</sup>While the lack of resumption of non-D-linked *wh*-phrases and quantified nouns is sometimes attributed to semantic clashes between these indefinites and the clitic pronouns, this does not account for the fact that Exhaustively Identified DPs that move to Spec,CP in Wolof cannot be resumed either. Resumption in Wolof is also not reserved only for (contrastive) topics, which is what some accounts (e.g. Arregi 2003) consider CLLD to be, since we have seen that subjects in Spec,CIP in V-raising clauses are not topics.

<sup>19</sup>A reviewer asks if the structure in which C and T are separate heads should not be treated as the “standard” structure, and the one in which the two heads are bundled as a special case, requiring some operation that derives it. I do not think we have reason to believe that either structure is more common cross-

for some Austronesian languages, which exhibit a voice system where one argument of the verb is chosen as the subject (“pivot”). A'-movement is limited to the subject, which suggests that its movement is related simultaneously to features traditionally associated with C and with T. Legate (2011, 2014) captures this through Feature Inheritance, proposing that in such languages features of C are not inherited by T (she terms this “underinheritance”), resulting in C probing with bundled features of both heads. Erlewine (2018), also looking at an Austronesian language, in a version of the approach taken here (and in Martinović 2015a, 2017a) proposes that CT probes as a bundled head, but in certain cases may reproject, creating something similar to what I am advocating for in this paper.<sup>20</sup> A “composite probe” has also been used in van Urk 2015, to argue that A- and A'-movement are distinguished only by the features that drive them and not the positions they target, deriving the lack of A/A'-distinction in Dinka. Van Urk assumes that composite probes are probes contained on the same head, but leaves open the possibility that there is some mechanism that forces two adjacent heads in the same extended projection to probe together.

The need for bundled heads is clear, and cases such as Wolof also create the need for the features of this bundled head to sometimes be distributed over more structure in one and the same language. A crucial question then is what the direction of the relevant operation is: can we make an argument in favor of starting with bundled features and splitting them into multiple heads, as opposed to starting with multiple heads that get bundled? Feature Inheritance, for example, takes the former view: all features that may trigger syntactic operations are initially located on phase heads, and present on other heads only by being passed down via some type of inheritance mechanism. One of the more obvious problems with FI is conceptual: downward inheritance is at variance with strict cyclicity, in that it assumes that featureless heads are merged into the derivation, inherit features from a higher head after it is merged, and then trigger syntactic operations which may lead to countercyclic Move or Merge. More problematic from our standpoint is the need to sometimes not pass on the features from a phase head, which puts into question the ability to identify the trigger for inheritance, and then the trigger for the suspension of inheritance, all the while maintaining the motivation for having such a mechanism in the first place. The present proposal in terms of partial head reprojection, on the other hand, is strictly cyclic and proceeds upward, and attempts to trigger Head-Splitting through the general feature-checking mechanism. Furthermore, it requires no new machinery to be added to the grammar. Head-Splitting is a version of head-reprojection, which has been advocated for many times (Pesetsky 1985; Ackema et al. 1993; Koenenman 2000; Haider 2000, 2005; Bhatt 2002; Hornstein and Uriagereka 2002; Fanselow 2003; Surányi 2005; Georgi and Müller 2010), and cross-linguistic variation in how features are checked (by only Agree or Agree and Move), which we can imagine would influence whether splitting occurs or not,

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linguistically, as opposed to being the result of an Indo-European bias. Furthermore, if a language does not have an overt complementizer layer in matrix clauses, as Wolof does, it is not immediately clear if C and T/Infl are separate heads or not.

<sup>20</sup>For Erlewine, it is important that the CT head reprojects whole and retains all the features of the original CT, as opposed to splitting them across the two heads.



is something independently needed as well.

The opposite direction, in which particular heads are being bundled as opposed to split, appears to me to necessarily require the expansion of the inventory of syntactic operations, and the trigger for bundling seems to be something that must be stipulated, as bundling can only occur after a cartographic structure has already been built. I briefly address one such recent proposal by Hsu (2021), who proposes the operation of *coalescence*, which applies at the interface of syntax and PF, but is crucially still a syntactic operation. Hsu proposes that coalescence is a bundling operation, which applies to structurally adjacent heads in a top-down fashion at the end of a syntactic phase. He proposes that features can be either dominant or recessive, and that a head with only recessive features are not legitimate PF objects, which forces it to coalesce with a dominant head that asymmetrically c-commands it (meaning that the topmost head in a spell-out domain must always be dominant). Additionally, only dominant heads have specifiers. Coalescence applies cyclically, until only dominant heads are left in the structure. Abstracting away from the details of the analysis, the major problem of applying it to the Wolof data discussed here is that such language-internal variation would need the same feature to be present in two forms, a dominant one and a recessive one. Specifically, in order for C and Infl to be bundled as one head in V-raising clauses, the lower head in those cases, Infl, would need to be recessive. In Wh-raising, on the other hand, Infl needs to be a dominant head. The difference between the two clause types, however, is in the Wh-feature, not in features that would be traditionally associated with Infl. The present proposal captures precisely this fact: Head-Splitting occurs in structures in which the Wh-feature is present, due to the need for the Wh-feature to be checked. In Hsu’s proposal, we would end up having to say that C in V-raising selects for the recessive Infl head, whereas it select for the dominant Infl head in Wh-raising. Novel machinery aside, this boils down to saying that this is a matter of selection. While selection is always a possible way to account for variation, it is descriptive, and not explanatory. Selection should be reserved for idiosyncratic phenomena, not commonly observed patterns. More broadly, this kind of an analysis does not predict that C and T should be related in any way; any co-occurrence of T/Infl-type features on C, for example, is accidental. The approach advocated for here predicts such cases to exist, if reprojection can be either total (where all features are “copied” onto a higher head) or partial.

Finally, there is a question as to which heads start out bundled, and more generally, what the clausal architecture looks like. I have here inspected a particular part of the structure, looking at cases in which there is variation in whether C and I jointly head only one projection, or two separate ones. But what about T? I began the paper by drawing attention to the long-established connection between C and T, and the cases mentioned above also appear to involve these two heads, so does it not then seem counterintuitive to now exclude T from this bundle? Taking the idea presented here to be a crucial part of clause-building in general, we could imagine that much bigger parts of the clause starts out as a bundle (for example, phases), unfolding via Head-Splitting depending on how individual features in a language can or must be checked. This could enable us to account for a variety of phenomena which rest on the observation that there is cross-linguistic variation in the

correspondence between the number of functional features and heads, most notably in the verbal inflectional layer and the left periphery, and for phenomena in which a certain element is sometimes instantiated in one position, and other times in another, in one and the same language (e.g. affixation vs. periphrasis inside one paradigm; definiteness marking in DPs in Scandinavian, etc.).

## 6 Conclusion

In this paper we investigated two Wolof clause-types that differ in the amount of structure over which features of C and Infl are distributed: they are either contained on one head, yielding non-cartographic effects, or spread over two heads, resulting in cartographic effects. I proposed a novel operation, Head-Splitting, which derives both clause-types, relying on the mechanism of strictly ordered feature-checking and cyclic partial head-reprojection. The proposal laid out here addresses the fundamental question of how a syntactic structure is built, and is as such highly relevant for one of the central questions resulting from the work on cartography – whether all functional elements are always present in the functional spine in all languages, or not. A strong version of the cartographic approach assumes that all functional heads are always in the structure, and cross-linguistic variation results from the presence or absence of Merge and/or Move and the overt or covert nature of functional heads and their specifiers. According to a weaker version of the cartographic approach, all functional projections are not necessarily always present in the functional structure, but if they do appear, they do so in a particular hierarchical order. Some proposals, such as the one laid out in Bobaljik and Thráinsson (1998), argue that the same features are in some languages spread over more functional heads, and in others bundled on fewer heads, as a point of parametric variation. My analysis takes a middle position, in that it allows for the hierarchy of functional projections to be transferred into a feature hierarchy inside a head, which may, via Head-Splitting, result in a hierarchy of projections. In other words, constructions that on the surface have less structure do have fewer projections, but the functional hierarchy may be preserved inside the head in the feature geometry.

This work also adds a novel perspective to the long-standing discussion on the nature of the connection between C and T. It has long been noted that C and T are not completely independent of one another, but share a host of properties. This is often captured via selection, however, the overwhelming cross-linguistic evidence for this connection makes such an analysis, reserved for idiosyncratic behaviors, unattractive. Wolof data show that there are languages in which C and T appear to be separate heads in some structures, and one head in other structures, pointing to their unified origin. The analysis advocated in this work allows us to capture the C-T link in a new way.

This proposal has potential repercussions for a variety of phenomena resting on the observation that there is cross-linguistic variation in the correspondence between the number of functional features and heads, most notably in the verbal inflectional layer and the left periphery, and for phenomena in which a certain element is sometimes instantiated in

one position, and other times in another, in one and the same language. If Head-Splitting is taken as a general clause-building mechanism, and larger chunks of syntactic structures (e.g. phases) are taken to start out as feature bundles, it has the potential to replace parametric accounts for such variation with a derivational mechanism that rests on well established ways in which Agree and Move operate.

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## A The syntax of CI with nominal predicates

In this Appendix I discuss clauses with nominal predicates, which present a potential challenge to parts of the analysis argued for in this paper.<sup>21</sup> Clauses with nominal predicates we are interested in here do not have a copular verb, so I refer to these structures as *copular sentences* for convenience. I start with an overview of the data and the issues to be discussed in this section.

### A.1 Copular sentences: Wh-raising with clitic subjects

Copular sentences in Wolof present a potential puzzle for the analysis thus far. A predicational, information-structurally neutral sentence, as in (50), appears to have properties of both V-raising and Wh-raising structures. On the one hand, it contains the sentence particle *la*, which occurs in Wh-raising clauses, in non-subject A'-extraction (see section 4), and the predicate DP A'-moves to its specifier. On the other hand, the clause-internal subject is obligatorily a clitic, just as it is in V-raising and unlike what we have seen in other Wh-raising clauses. An optional lexical subject is located to the left of the predicate, similar to what we saw in V-raising clauses.

- (50) Affirmative copular sentence  
 Xale yi sàcc la=\*(ñu).  
 child the.PL thief C<sub>Wh</sub>=3PL  
 “The children are thieves.”

Table 3 summarizes the relevant properties of V-raising and Wh-raising clauses, and illustrates the overlapping characteristics of copular sentences with both clause-types. ([Wh<sup>+</sup>] DP here only means that a DP A'-moves to Spec,CIP.)

	V-raising	Copular	Wh-raising
<b>CIP-layer</b>	V-to-CI	[Wh <sup>+</sup> ] DP to Spec,CIP	[Wh <sup>+</sup> ] DP to Spec,CIP
<b>Lexical subject</b>	left of CI	left of CI	below CI
<b>Subject clitic</b>	obligatory	obligatory	non-obligatory

Table 3: Syntactic characteristics of V-raising, Wh-raising, and Copular clauses

Support for the claim that the structure in (50) involves A'-movement comes from the fact that questions in which the wh-phrase is the predicate have the same form, DP<sub>Subj</sub> DP<sub>Pred</sub> *la*=SCL, as in (51). Here the *wh*-word occupies the position preceding *la*, as in any

<sup>21</sup>For a more detailed discussion of various types of copular sentences in Wolof, see Martinović 2015a. For a descriptive overview and a discussion of some of their information-structural properties see Martinović 2013b, 2015b.

Wh-movement structure, but the clause-internal subject is obligatorily a clitic, as in the declarative sentence in (50). Second, such clauses can be extracted out of long-distance, as in (52), which is in Wolof only possible in the presence of the A'-movement complementizer (Dunigan 1994; Martinović 2015a, 2017b).

(51) Predicate question copular sentence

Xale yi      lan    **la**=ñu?  
 child the.PL what C<sub>Wh</sub>=3PL  
 ‘What are the children?’

(52) Long-distance extraction from a predication copular sentence

Lan **la**    Magat   gëm    ni   xale yi      *t<sub>i</sub>* **la**=ñu?  
 what C<sub>Wh</sub> Magatte believe that child the.PL *t<sub>i</sub>* C<sub>Wh</sub>=3PL  
 ‘What does Magatte believe the children are?’

The parallel between (50) and (51) shows that the specifier of *l(a)* in copular clauses is a position to which every nominal predicate A'-moves to.

I claim in section 4 that the subject position is available in Wh-raising constructions due to Head-Splitting, resulting from the featural composition of CI<sub>Wh</sub> and the particular mechanism of feature checking. One task here is to explain why a copular sentence, also a Wh-raising construction, cannot have a non-clitic subject to the right of CI, as in (53).

(53) No clause-internal subject in copular sentences

\*Sàcc la      xale yi.  
 thief C<sub>Wh</sub> child the.PL  
 Intended: ‘The children are thieves.’

There are other types of copular sentences that look like the traditional V-raising and Wh-raising clauses. I do not discuss them here, nor the distribution of the different copular sentence types. For a detailed discussion, see Martinović 2015a. My focus are the copular sentences presented above, with no copula, the nominal predicate in Spec,CIP, and an obligatory clause-internal subject clitic. I argue that these sentences are in fact regular Wh-raising structures, and that the clause-internal subject can only be a clitic due to ordering requirements placed on the predication structure containing the two main constituents during Spell-out.<sup>22</sup> The argument proceeds as follows.

First, I propose that the two nominal constituents in a copular sentence start out in an asymmetrical small clause. I adopt the analysis by Ko (2014) (that builds on Fox and Pesetsky 2005), who argues that small clauses are Spell-out domains wherein the order of the two constituents is fixed for the remainder of the derivation. Given that the predicate

<sup>22</sup>I thank Colin Davis for this suggestion.

raises to Spec,CIP, a non-clitic subject can only surface if it is to the left of the predicate. Subject clitics, however, seem to be exempt from the ordering requirements imposed by linearization. I argue that this has to do with the ability of clitics to escape the small clause before linearization. I also propose that the non-clitic subject can surface only if it is contained together with the clitic in a *big*-DP, as in V-raising sentences.

I continue this section by first discussing the properties of clitics and clitic movement, as this is the central part of the argument. I then spell out the analysis of copular sentences.

## A.2 Wolof clitics

The main component of the analysis of copular sentences is explaining why these Wh-raising structures allow for only clitic subjects, even though they should contain a position for a clause-internal subject, as argued in section 4. In order to understand the argument that I will put forth, we need to take a closer look at the morphosyntax of Wolof clitics.

Clitics in Wolof finite indicative clauses surface immediately following the highest functional head in the clause – to the right of the sentence particle in a fixed order (SUBJ > OBJ > LOC), as in (54).

- (54) Clitics cluster after CI in finite clauses  
 Ñoom jox-na=ñu=ma=ko=fi.  
 3PL.STR hand-C<sub>V</sub>=3PL=1SG.OBJ=3SG.OBJ=LOC  
 ‘They handed it to me here.’

Positioning of pronominal clitics in a cluster immediately to the right of CI is reminiscent of 2nd position (Wackernagel) cliticization, and is obligatory in mono-clausal structures with a sentence particle. However, this position itself is not what licenses them; clitics can land in a variety of positions along the clausal spine. For example, in a *minimal clause* (see §2), which has been argued to be the size of a vP (Zribi-Hertz and Diagne 2002), the subject clitic is preverbal and appears to be in-situ, while the post-verbal clitics move to the highest head, by hypothesis v. Evidence for this comes from double-object constructions, where lower clitics move over higher arguments to follow the verb. In Wolof double-object constructions the Goal commonly (and for some speakers obligatorily) precedes the Theme (Zribi-Hertz and Diagne 2002, 853). If the Theme object is a clitic, it cannot stay in situ, but must move to be right-adjacent to the verb, over the Goal, as in (55) (example from Zribi-Hertz and Diagne 2002, 853). In that case, the clitic is ambiguous between a Theme and a Goal.

- (55) Object clitics in double-object constructions in minimal clauses  
 Ñu=wan=ko Aram.  
 3PL=show=3SG.OBJ Aram  
 (i) ‘They show Aram to him/her’

(ii) *They show him/her/it to Aram.*'

I propose that clitics move through the clausal spine in a stepwise fashion, moving to each new functional head as it is merged into the derivation. Evidence that this analysis might be on the right track comes from the interaction of clitics with a morpheme that can occur at the edge of an embedded infinitive clause. There are two varieties of this morpheme, one being *a*, and the other *di*, both of which also occur as imperfective aspect in Wolof. In Senegalese Wolof, there is a preference to use *di* as imperfective aspect, and *a* in infinitival clauses, as in (56), though speakers recognize that they are interchangeable. I gloss it descriptively as INF here.

(56) The infinitive marker

Da=ma      bëgg a/di toog jën yi.  
do.C<sub>V</sub>=1 SG want INF cook fish the.PL  
'I want to cook the fish(pl).'

INF generally occurs only in contexts as in (56), between two verbs, and speakers often drop it. It is not crucial for our purposes to determine its exact position, what is relevant is that this position is a target for clitic movement, which can be seen in cases of A'-fronting of the embedded infinitival clause. (57a) shows a restructuring construction, in which the clitic *leen* 'them' climbs from the embedded non-finite clause to the matrix C, a common restructuring phenomenon. In the dialect that the data in this paper come from, clitic climbing to the matrix C is obligatory; the clitic cannot, for example, follow the infinitive morpheme, as in (57b). However, if the whole non-finite clause is fronted to Spec,CP, then the clitic can remain in the embedded clause, and what is more, it can be attached to the infinitive marker *a*.

(57) Non-finite clause fronting

- a. Da=ma=leen      bëgg a      toog.  
do.C=1 SG=3 PL.OBJ want INF cook  
'I want to cook them.'
- b. \*Da=ma      bëgg a=leen      toog.  
do.C=1 SG want INF=3 PL.OBJ cook
- c. [Leen=a togg]      la=a      bëgg.  
[3 PL.OBJ=INF cook] C=1 SG want  
'To cook them is what I want.'

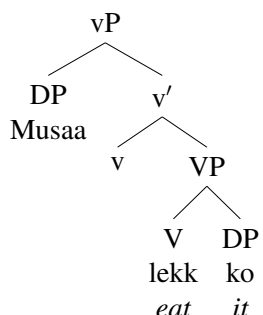
I take this to mean that the clitic makes a stop at the edge of the infinitive clause on its way to the matrix C. Why clitic climbing is not obligatory in cases of vP fronting is a separate question.<sup>23</sup>

<sup>23</sup>Note also that the order of the clitic and the infinitive marker is reversed from what we would expect, if

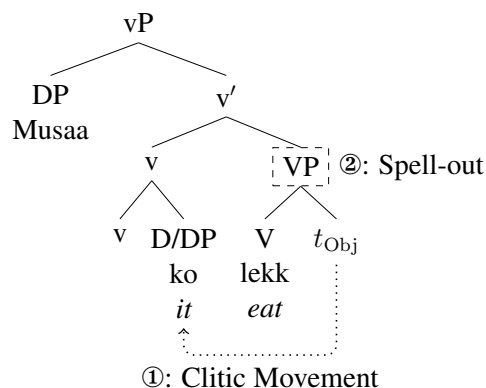
Clitics often show mixed behavior, in that they appear to have properties of both heads and phrases, so they are standardly treated as simultaneously minimal and maximal projections (e.g. Sportiche 1996). I argue that this allows them to both adjoin to heads, but then also continue moving up the clausal spine by effectively excorporating from the head that they were adjoined to. That clitics move via a special type of movement, distinct in certain ways from both head movement (in that it often appears to be long-distance) or phrasal movement (in that they appear to be attached to heads) has been observed many times (see e.g. Dunigan 1994; Ouhalla 1989; Arregi and Nevins 2012 on Wolof, Berber, and Basque, respectively). I propose that clitics move from their base position and adjoin to the next higher head as soon as that head is merged. I also assume Cyclic Spell-out (Uriagereka 1999), and crucially propose that clitics move out of a particular Spell-out domain *before* Spell-out, and keep moving along the clausal spine as new functional heads are merged. Movement of the clitics before Spell-out is a crucial assumption that will allow us to explain obligatory clitic subjects in copular sentences. I discuss the details of Spell-out and how it is relevant for the issue in question in the next section.

Let us illustrate this proposal with a simple example. Consider the structure in (58). Assume that *v* triggers Spell-out of its complement, VP, which contains the object clitic *ko*. The object clitic *ko* moves out of the VP before Spell-out takes place, and adjoins to *v*. Other syntactic movements can follow Clitic Movement, but the different operations are independent of one another.

(58)



(59)



I follow Fox and Pesetsky (2005) in assuming that once a particular domain is spelled out (which in this context means *linearized*), the order of its constituents with respect to one another cannot be changed in higher domains, even though they can still move out of the spelled out domain.

I propose that Clitic Movement proceeds along the functional spine as illustrated above, moving to adjoin to each new functional head, as it is merged, and out of phases before

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*a* is a functional head, and the clitic adjoins to its right, as I proposed that clitics do. This is likely the result of a phonological operation: *a* is an enclitic, and must lean to a preceding phonological word, therefore it metathesizes with the pronominal clitic. We have seen in (55) that the subject pronominal clitic has no issue with being initial; I stipulate that this is applicable to other pronominal clitics as well.



Spell-out. Clitics will therefore not be linearized until the end of the derivation. In the following section, I demonstrate how this proposal allows us to explain that copular sentences can only contain clitic subjects.<sup>24</sup>

### A.3 The analysis

Our main task in this section is to explain why in copular sentences, which are A'-movement constructions, the clause-internal subject must be a clitic. I proposed in section 4 that A'-movement constructions contain a CI with the structure in (60).

- (60) Feature geometry of CI in Wh-raising clauses  
 $[_{CI} \text{ EPP}^* [_{CI} \text{ Wh}^* [_{CI} \text{ CI} ] ] ]$

I also propose, following Bowers (1993); Svenonius (1994); Adger and Ramchand (2003); Mikkelsen (2005); den Dikken (2006), and others, that the two nominals in a copular sentence are contained inside an asymmetrical *small clause*, where the relationship between the two nominals is mediated by a functional head. Since in Wolof the predicate A'-moves to Spec,CIP, I endow it here with a  $[\text{Wh}^+]$  feature.<sup>25</sup> The structure of this predicational clause is illustrated in (61).

- (61)
- $$\begin{array}{c}
 \text{PredP} \\
 \swarrow \quad \searrow \\
 \text{DP}_{\text{Sbj}} \quad \text{Pred}' \\
 \quad \swarrow \quad \searrow \\
 \quad \text{Pred} \quad \text{DP} \\
 \quad \quad [\text{Wh}^+]
 \end{array}$$

What we see in Wolof is that the subject in (61) cannot be a non-clitic DP. This is puzzling, as the derivation of a copular sentence should proceed in the same manner as the derivation of any *wh*-movement construction where the extracted element is a non-subject.

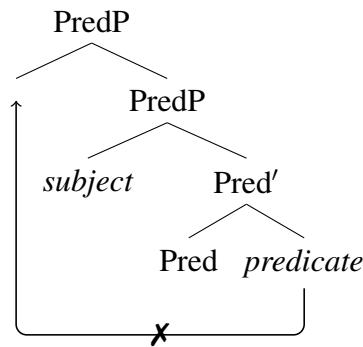
<sup>24</sup>Anagnostopoulou (2003) discusses a phenomenon in Greek in which cliticization is obligatory in certain cases of DP movement; specifically, in double object constructions a lower nominative argument can move to Spec,TP over a higher argument only if the higher argument is a clitic (which in that case also moves to T). Anagnostopoulou relates this to locality – a DP cannot undergo A-movement over an intervening DP. Since we are dealing with A'-movement of a predicate over a subject in Wolof, it is difficult to invoke a violation of Locality. The analysis proposed here, however, might be extendible to the phenomenon in Greek. In any case, the observation that cliticization licenses another type of movement in both Greek and Wolof is worth noting.

<sup>25</sup>I have already briefly mentioned the very interesting fact that there are essentially two options in Wolof finite clauses: either the verb raises to CI, or an XP A'-moves to Spec,CIP. The two operations being in complementary distribution has potentially interesting consequences for our understanding of the notions of *predication*, the relationship between head movement and A'-movement, and the nature of the features that trigger them. Some preliminary thoughts on how A'-movement is related to predication can be found in Wedgwood 2003; É. Kiss 2006; Klecha and Martinović 2015.

The explanation I offered for the unavailability of non-clitic subjects in V-raising clauses is the absence of a subject position below the sentence particle, as a result of an unsplit CI head. Wh-raising sentences, however, have a split CI head, and the splitting occurs due to the feature composition of CI and the proposed ordered feature-checking. The reason for the clause-internal subject being a clitic in copular sentences therefore cannot be the absence of a subject position to the right of the sentence particle.

I propose that the obligatoriness of a clitic subject in copular sentences is due to an order-preservation effect. I follow Ko (2014) who develops arguments for the model of Spell-out proposed in Fox and Pesetsky 2005, according to which cyclic effects in syntax are the result of Cyclic Linearization, a mapping procedure between the syntax and PF, which establishes relative orderings of syntactic elements inside a Spell-out domain. Nothing prohibits movement out of a spelled out domain, as long as the linear order established during Spell-out is maintained. If an element from inside the domain moves to the edge, then when it is spelled out it will precede all other syntactic elements in the domain and will be free to move to a higher domain, capturing the *escape hatch* property of the edge of a phase. If, however, an element that moves to a higher domain results in ordering information that is not consistent with that stored in previous cycles, the derivation cannot be linearized at PF. Ko (2014) argues that small clauses, such as the PredP in a copular sentence, are Spell-out domains. Unlike larger predication structures, such as vPs, the predicate inside the PredP cannot move to the edge of PredP, illustrated in (62), as this would violate locality constraints on movement: the complement of a head should not move to its specifier.

(62) Anti-locality and predicate fronting



I have argued that clitics are special in that they can escape PredP before it is spelled out. The subject clitic therefore does not get linearized with respect to the predicate DP during the Spell-out of the PredP. If the subject in a copular clause is a clitic, no ordering conflict arises.

Before illustrating the proposal with a derivation, let us take a look at the non-clitic subject, which can occur to the left of the nominal predicate in copular sentences. In V-raising clauses, we saw that the subject position to the left of CI was a non-topic position, due to the fact that a subject in those sentences can be a bare quantifier (see (20)). I therefore pro-

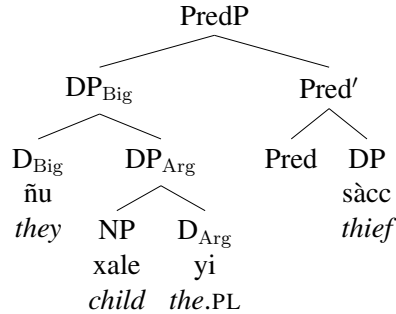
posed that in V-raising clauses the subject is in Spec,CIP. In Wh-raising clauses, however, another element already occupies Spec,CIP – the A'-moved phrase. The non-clitic subject can therefore not occupy Spec,CIP, but must be in a position to the left of it, and there is evidence that this is indeed so. In copular sentences, namely, a bare quantifier cannot be the subject:

(63) No bare quantifier subject in copular sentences

\*Kenn<sub>i</sub>      sàcc la= $\emptyset$ <sub>i</sub>.  
 someone thief C<sub>Wh</sub>=3SG  
*intended: 'Someone is a thief.'*

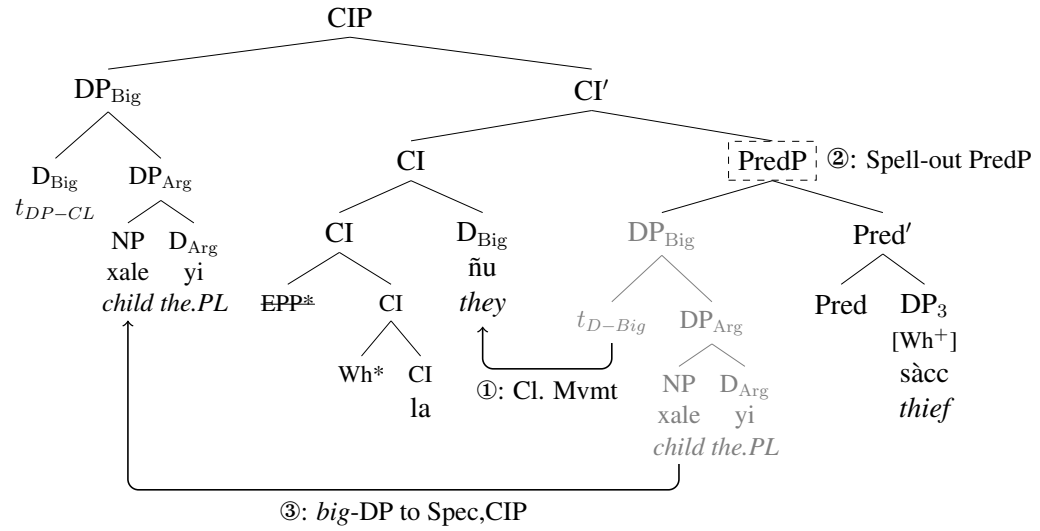
Given the fact that bare quantifiers cannot be topics, it follows that the non-clitic subject in copular sentences is obligatorily left-dislocated to a topic position. I propose that, similar to the subject in V-raising structures, a non-clitic subject in copular sentences can only occur if it is part of a *big*-DP. One of the conditions placed on the *big*-DP is that the doubled argument not remain clause-internal. Such DPs are therefore always to the left of CI. In the case of copular sentences, the non-clitic DP can only be topicalized, as Spec,CIP is occupied by the predicate DP. Thus, only the derivation with subject topicalization converges. This structure also satisfies the ordering requirements placed by *Cyclic Linearization* on the small clause. The derivation of a clause with a *big*-DP subject is as follows. The structure of the predication small clause is given in (64).

(64)



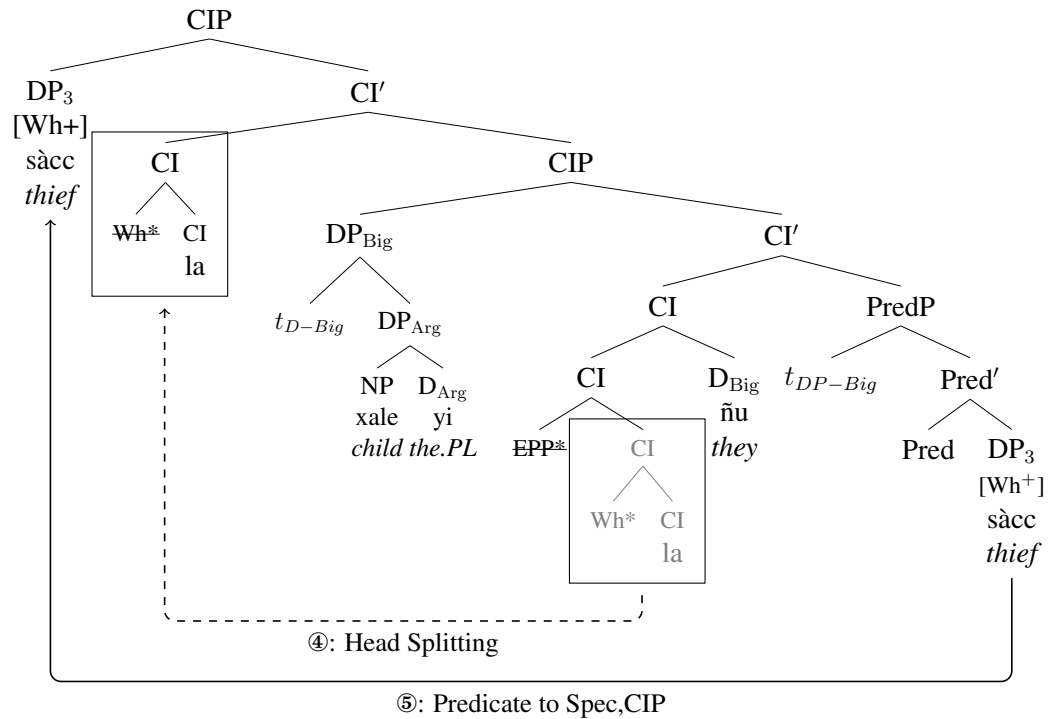
The first step is for the clitic to escape the PredP, by adjoining to the higher functional head (①). For the purposes of illustration, I skip all intervening heads between PredP and CI. The predicate DP cannot move to the edge of PredP, since this would violate locality. Next, PredP is spelled out and the order of DP<sub>Big</sub> and the predicate DP is at this point fixed (②). CI then continues to check its features, the highest of which is EPP\*, checked by the movement of the *big*-DP.

(65)



Next, [Wh\*] probes and finds the predicate DP, but, just as in non-subject extraction in other wh-clauses, Spec,CIP is already occupied. The alternative derivation, the one in which CI splits, is the one that converges.

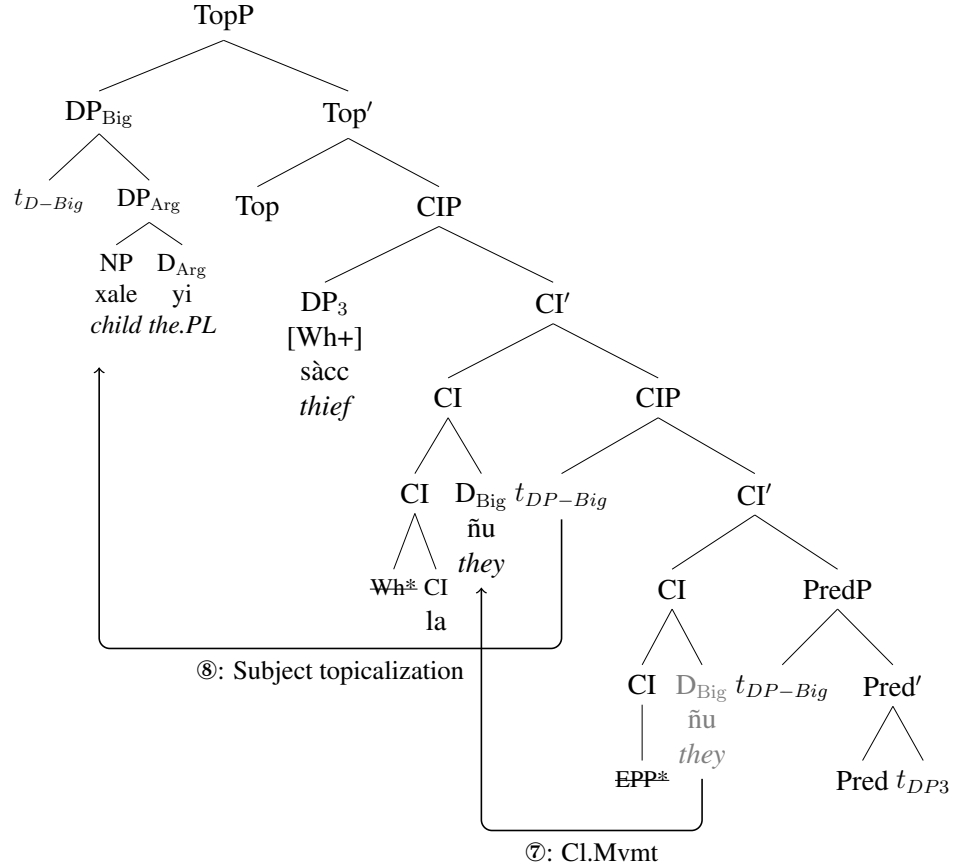
(66)



The subject clitic moves one last time to adjoin to the newly formed CI. And finally, due to the requirement that the doubled argument not remain clause-internal together with

the clitic, it topicalizes, as in (67). This also resolves the ordering conflict that would arise if the subject DP ended up linearly following the predicate DP in the final structure.

(67)



#### A.4 Summary

In this section I addressed data from copular sentences, which present a more complex picture of the interplay between the two featurally different types of CIs and the availability of a clause-internal subject position. I attributed the apparent absence of a subject position in copular clauses, which are Wh-movement constructions and should therefore have one, to an order preservation effect argued for in Fox and Pesetsky (2005) and Ko (2014). Order Preservation requires the order of constituents in a predication domain, here specifically a small clause, established during Spell-out, to remain unchanged in the rest of the derivation. Given that the predicate DP in Wolof copular sentences A'-moves to the higher Spec,CIP, a subject in a lower Spec,CIP would cause a violation of Order Preservation. I proposed that clitics are exempt from such a requirement, given their unique type of movement, which takes them up the clausal spine in a stepwise fashion. I argued that this movement occurs before Spell-out of a particular domain. Given that the predicate nominal in copular

sentences ends up in Spec,CIP, the only subject that can be lower than the predicate is a clitic. Any other subject nominal can only be in a left-dislocated position.