

*Wh*-Morphology and Cyclicity in Wolof  
[Currently under revision. Comments greatly appreciated.]

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# 1 Introduction

A'-movement and morpho-syntactic phenomena resulting from it have given rise to much discussion in the field since the seminal works on the topic in the late 60's and early 70's, beginning with Ross 1967. A lot has been uncovered regarding the nature of this type of movement, most notably that the seemingly distant relationship between an A'-moved element and the extraction site in fact consists of a series of local connections, first proposed by Chomsky (1973) and substantiated by investigation of languages with overt morphological evidence for locality of movement. One such language is Irish, in which an A'-movement complementizer (*aL*) marks each intermediate C position between the extraction site and the final landing site (McCloskey 2000, 2001, 2002). Another A'-movement effect reflects agreement between the complementizer and the *wh*-operator and/or the trace in its specifier, usually in  $\phi$ -features, as, for example, in Kinande (Schneider-Zioga 1995, 1996, 2000, 2007). The third phenomenon related to A'-extraction relevant for the present discussion, and a very controversial one, are various subject/non-subject asymmetries, for example the *that*-trace effect in English (Perlmutter 1971), in which the complementizer *that* is obligatorily absent from the CP out of which a subject is extracted. An important cross-linguistic property of these effects is that the first two occur in a cyclic fashion along the entire path of A'-movement, while the last one is local, limited to the clause in which the extracted phrase originates.

This paper explores the *wh*-morphology and cyclicity of local and long-distance A'-extraction effects in the Niger-Congo language Wolof. A'-extraction in Wolof possesses all the aforementioned morphological reflexes of movement: marking of its cyclicity, a subject/non-subject asymmetry, and agreement between the *wh*-complementizer and the extracted phrase. All effects surface on C, but interestingly, with different allomorphs of the complementizer. The A'-structures with the two C allomorphs are for the most part in complementary distribution, so the various effects never surface all at once. In this paper I explore two related topics: the first one deals with the morpho-syntactic characteristics of the extraction effects, and the second addresses their interaction and its consequences.

I analyze all three A'-extraction effects as agreement between C and some element in the clause. The presence or absence of a locality effect is attributed to the nature of the agreement relationship. Consider, for example, local extraction schematized in (1), where the C head has an uninterpretable

feature  $uF$ , valued via agreement with a DP in C's c-command domain. The DP can either have a matching interpretable feature  $iF$ , or a matching uninterpretable feature  $uF$ .

(1) Local extraction

- a.  $[_{CP} C[uF] \dots DP[iF] ]$
- b.  $[_{CP} C[uF] \dots DP[uF] ]$

C can check its  $uF$  against the corresponding feature in both (1a) and (1b); in the former case, the DP carries a matching interpretable feature, and in the latter case a valued uninterpretable feature, which, upon being checked by an  $iF$  on a different head, is not immediately deleted but stays available for further operations within the same phase (Pesetsky and Torrego 2001). In sum, both interpretable and valued uninterpretable features of a DP can check uninterpretable features on C in local extraction.

The situation in long-distance extraction, illustrated in (2), is different.

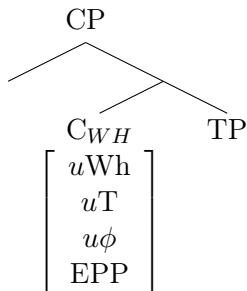
(2) Long-distance extraction

- a.  $[_{CP} C[uF] \dots [_{CP} DP[iF] \dots ]]$
- b.  $[_{CP} C[uF] \dots [_{CP} DP[\cancel{uF}] \dots ]]$

The DP in the embedded CP can check  $uF$  on the higher C in (2a), but not in (2b). This is the result of feature life-span: I assume that, while interpretable features are available throughout the entire derivation, uninterpretable features, once valued, must be deleted at the end of the phase in which they are generated (Pesetsky and Torrego 2001). The  $uF$  on the DP therefore cannot participate in agreement outside its own phase. Thus the uninterpretable feature of C in (2b) must be checked by some other means. In other words, only interpretable features can participate in long-distance agreement relations.

All instances of A'-movement in Wolof are obligatorily accompanied by  $C_{WH}$ , and all extraction effects are realized on C, which has the syntax and feature specification in (3).

(3) Feature Specification of C in Wolof



Wolof presents an important case for the exploration of A'-extraction agreement effects, because the three effects are not all displayed simultaneously; each surfaces in the environment of a different allomorph of the *wh*-complementizer: *(l)a* or CM-*u*. The allomorph *(l)a* shows two agreement effects: long-distance agreement, by occupying every intermediate C position, and in that way resembling the Irish complementizer *aL* (Author, 2013), as in (4), and local agreement, a subject/non-subject asymmetry, illustrated in (5) and (6). In local subject extraction, the complementizer surfaces as *a*, and in object extraction and non-local extraction, as *la*.<sup>1</sup>

- (4) Cyclicity in A'-movement in Wolof<sup>2</sup>  
 K-an **l-a**-ñu gëm ni **l-a** Musaa xalad ni **l-a** Aali gis?  
 CM-an *l*-C<sub>WH</sub>-3PL believe that *l*-C<sub>WH</sub> Musa think that C<sub>WH</sub> Ali see  
 “Who do they believe that Musa thinks that Ali saw?”
- (5) Subject Question  
 K-an **a** jox Musaa téére bi?  
 CM-an C<sub>WH</sub> hand Musa book DEF.SG  
 “Who handed the book to Musa.”
- (6) Object question  
 K-an **l-a** Musaa gis?  
 CM-an *l*-C<sub>WH</sub> Musa see  
 “Who did Musa see?”

The *a/la* asymmetry is strikingly similar to the *that*-trace effect. In both cases, an element occurs in C in case of non-subject extraction, but is absent in subject extraction (*that* in English, *l* in Wolof). Furthermore, in both languages, the form of the complementizer is sensitive to the grammatical relation (Case) of the extracted phrase, but only in the clause in which the extracted element originates, meaning that the effect is local. I follow Pesetsky and Torrego (2001) in analyzing this type of a subject/non-subject asymmetry as a result of an agreement relationship between T and C. I argue that *l*-, which directly precedes *a* in non-subject extraction (as in (6)), is an instance of T-to-C movement, triggered by the presence of an uninterpretable T-feature (*uT*) on C. In case of subject extraction, *uT* is deleted by the moved subject itself, under the assumption that nominative case is *uT* on D, which accounts for the absence of *l*- in (5).

This analysis explains the cyclicity of one effect and the locality of the other in long-distance extraction. *(L)a* occupies each intermediate C position signaling *wh*-agreement between C and the *wh*-phrase, which carries an interpretable Wh-feature. In the most embedded clause, in case of subject extraction, *uT* on C is satisfied by the moved subject (which has a valued *uT*), however, in

<sup>1</sup>Unless otherwise noted, all the data in this paper come from my own field work with native speakers of Wolof.

<sup>2</sup>Abbreviations: AFF = affirmative, AUX = auxiliary, CM = class marker, DEF = definite determiner, DIST = distal, FUT = future tense marker, IMPERF = imperfective marker, INDEF = indefinite determiner, PERF = perfective marker, PRED.FOC = predicate focus, PROX = proximal, PST = past tense marker, Q = question word.

each higher clause the local T (surfacing as *l*-) must check *u*T on C, since the valued *u*T on DP is deleted within its phase of origin.

Wolof also has the type of complementizer agreement found in A'-extraction in Kinande: the *wh*-complementizer agrees in  $\varphi$ -features (noun class) with the extracted phrase in its specifier. Its properties are illustrated in (7) and (8). The consonant attached to the left of the complementizer exponent *-u* in these examples (*b*- and *g*-) is a class marker (CM), that agrees with the head noun in class. This allomorph only shows up at the top of the dependency, and not in the intermediate C positions (there, *(l)a* is obligatory).

- |  |   |
|--|---|
| <p>(7)     <u>Relativized <i>b</i>-CLASS NOUN</u></p> <p>xaɟ <b>b-u</b>        ma   bëgg</p> <p>dog CM-C<sub>WH</sub> 1SG like</p> <p>“a dog I like”</p> | <p>(8)     <u>Relativized <i>g</i>-CLASS NOUN</u></p> <p>góór <b>g-u</b>        ma   bëgg</p> <p>man CM-C<sub>WH</sub> 1SG like</p> <p>“a man I like”</p> |
|--|---|

The subject/non-subject asymmetry surfaces with the allomorph *(l)a*, and  $\varphi$ -agreement with the allomorph CM-*u*. The two exponents are in near-complementary distribution: *(l)a* occupies C in long distance extraction, focus constructions, and comparatives, and CM-*u* in relative, temporal and conditional clauses. The only construction in which both allomorphs are permitted are *wh*-questions.

It is not unusual for a language to display more than one effect related to A'-extraction. In Chamorro, for example, the complementizer form depends on the type of the phrase in its specifier, and a special morpheme on the verb (*wh*-agreement) encodes the grammatical relation of the extracted phrase (Chung 1998). The Wolof case is therefore typologically not unique. The difference between Wolof and Chamorro is in the element on which agreement is encoded: in Chamorro, one type of effect surfaces on the complementizer and the other type on the verb, while Wolof encodes both on the complementizer. I argue that this is the reason for the distributional properties of Wolof A'-extraction effects. Specifically, C<sub>WH</sub> is an agreeing complementizer, with uninterpretable Wh-, T- and  $\varphi$ -features. The uninterpretable Wh- and  $\varphi$ -features are valued via Agree under c-command between C and the *wh*-phrase, and the uninterpretable T-feature via T-to-C movement, or the movement of the subject to Spec,CP (since both can value *u*T). I consider the difference in surface forms of C to be the result of post-syntactic morphological rules, which realize C as *-u* when it is adjacent to the  $\varphi$ -feature, and as *a* in all other environments. In other words, in my analysis *a* and *-u* are allomorphic realizations of C, crucially dependent on the presence or absence of  $\varphi$  in C.

I propose that the presence of the  $\varphi$ -features in C depends on the presence of matching  $\varphi$ -

features in Spec,CP. Crucially, if an overt marker of a  $\varphi$ -feature shows up in C, it cannot show up in Spec,CP, and vice versa, as can be seen in *wh*-questions, the only A'-movement construction which can surface with either of the allomorphes of the complementizer:

- |  |  |
|--|--|
| <p>(9) <u><i>Wh-question with (l)a</i></u><br/> <b>K-an</b> l-a-ñu                      gis?<br/> CM-Q l-C<sub>WH</sub>-1/3PL see<br/> <i>“Who did we/they see?”</i></p> | <p>(10) <u><i>Wh-question with CM-u</i></u><br/> (*K-an) <b>K-u</b>                      ñu                      gis?<br/> (CM-Q) CM-C<sub>WH</sub> 1/3PL see<br/> <i>“Who did we/they see?”</i></p> |
|--|--|

The difference between (9) and (10) is that the question with *(l)a* obligatorily has an overt question word in its specifier (*k-an*), while the question with *CM-u* obligatorily has a null specifier. I offer a realizational analysis of these facts in the framework of Distributed Morphology, arguing that Wolof has a morphological Obligatory Contour Principle constraint, which prohibits the  $\varphi$ -feature to occupy two adjacent nodes (here the head C and its specifier). I propose that this constraint can be satisfied by deleting one of the nodes containing the  $\varphi$ -feature, provided it does not contain any other, irretrievable morphosyntactic features. The alternation in complementizer form is thus contextual allomorphy: *-u* occurs in the the context of  $\varphi$ , and *a* elsewhere. The surface realization of T is also the result of a realizational rule, which only inserts *l* if T is adjacent to C, as a result of universal adjacency conditions on contextual allomorphy (Embick 2010).

The paper is organized as follows. In §2, I give an overview of some relevant elements of Wolof clausal structure. Section 3 situates Wolof A'-movement effects in cross-linguistic context. Complementizer agreement in C is discussed in §4, and Case agreement in §5. Distributional facts and complementizer allomorphy are analyzed in §6. The paper is concluded in §7.

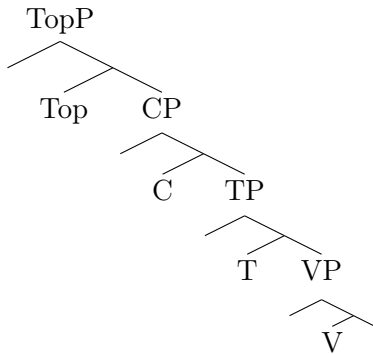
## 2 Wolof clausal structure

In this section, I present arguments for the clause structure I assume in the rest of the paper, focusing on two parts of the clause. First, we briefly familiarize ourselves with the position and function of complementizer-like elements in Wolof, since the A'-movement complementizer is one such element. Second, I address the status of pronominal subjects, because their position signals that the element to their left or right, depending on the construction, is a complementizer.

Wolof belongs to the Atlantic branch of the Niger-Congo language family, most widely spoken in Senegal, but also in the Gambia and Mauritania. For the purposes of the present discussion, I

assume that Wolof sentences have the basic structure in (11).

(11) Wolof clausal structure



Wolof is an SVO language, as shown in the neutral, affirmative sentence in (12):

(12) Affirmative sentence

Xale yi        jox na-ñu        Musaa tééré bi.  
child DEF.PL give C<sub>AFF</sub>-3PL Musa book DEF.SG  
*“The children gave Musa the book.”*

The basic word order is changed in A'-movement structures, such as focus constructions, in which the focused element is fronted:

(13) Object focus

Tééré bi        l-a xale yi        jox Musaa.  
book DEF.SG l-C<sub>WH</sub> child DEF.PL give Musa  
*“The children gave [THE BOOK]<sub>FOC</sub> to Musa.”*

Aside from word order, (12) and (13) differ in two more ways. First, in both sentences there is an element in the clause called a *sentential particle* – *na* in the affirmative sentence, and *la* in the object focus sentence. Second, the *subject marker* follows the particle *na* in (12) (*ñu*, 3PL), but is absent in (13). I discuss the properties of these elements in the remainder of this section.<sup>3</sup>

The presence of a sentential particle is obligatory in order for the sentence to receive temporal interpretation; sentences which lack particles also lack overt tense morphology, and their temporal interpretation depends on context (Njie 1982).<sup>4</sup> There are a number of different particles: subject and complement focus particles, imperative, affirmative, obligative and negative imperative/obligative particles, and four different temporal modality particles, which express reference to

<sup>3</sup>Another difference is the position of the verb. This is not relevant for the present purposes.

<sup>4</sup>The temporal interpretation of sentences in Wolof is rather complex, and depends on the clause type, the presence or absence of overt tense morphology, and verb type. For detailed discussion, see Dunigan 1994.

a past event, near or remote in time, or reference to a hypothetical or expected future event. Due to their complementary distribution, Dunigan (1994) assumes that all sentential particles occupy a single position in the clause. As this paper only explores A'-movement constructions, I am not concerned with the status of other sentential particles; the important fact to bear in mind is that they do not co-occur with each other. I argue that the particles which occur in A'-movement are allomorphs of the *wh*-complementizer located in C, which takes a TP as its complement.

In (12), a subject marker (*ñu*, 3PL) follows the clausal particle *na*, but it is altogether absent in (13). Wolof subject markers are differently analyzed in the literature – as either agreement morphemes or pronominals – due to the fact that they are obligatory in addition to a lexical subject in some constructions, as in the affirmative sentence in (12), and in complementary distribution with lexical subjects in others, as in the focus sentence in (13). Dunigan (1994) and Russell (2006) convincingly claim that when lexical subjects are at the left edge of the clause and subject markers follow the clausal particle, as in (12), the structure has an obligatorily left-dislocated (topicalized) lexical subject and a resumptive subject pronoun in Spec,TP. I follow this analysis and consider subject markers to be pronominal elements.

In all A'-movement constructions lexical subjects and subject pronouns are located next to the sentential particle, i.e. the A'-movement complementizer. In case of non-subject extraction this position is to the right of the complementizer, as in (14) and (15).

(14) Subject marker and lexical subject in object focus

- a. Aali l-a      **góór gi** gis.  
      Ali l-C<sub>WH</sub> man      DEF.SG see  
      “The man saw [ALI]<sub>FOC</sub>.”
- b. Aali l-a-**∅**      gis.  
      Ali l-C<sub>WH</sub>-3.PL see  
      “He saw [ALI]<sub>FOC</sub>.”

(15) Subject marker and lexical subject in non-subject relative

- a. góór gi      k-u      **Aali** gis  
      man DEF.SG CM-C<sub>WH</sub> Ali      see  
      “the man who Ali saw”
- b. góór gi      k-u      **mu** gis  
      man DEF.SG CM-C<sub>WH</sub> 3SG see  
      “the man who he saw”



In subject extraction, the lexical subject or the subject marker are left-adjacent to the complementizer, due to the fact that they A'-move to its specifier, as in (16) and (17).

(16) Subject marker and lexical subject in subject focus

- a. **Aali**-a (>Aalee) gis xale bi.  
     Ali-C<sub>WH</sub>           see child DEF.SG  
     “[ALI]<sub>FOC</sub> saw the child.”
- b. **Mu**-a (>moo) gis xale bi.  
     3SG-C<sub>WH</sub>       see child DEF.SG  
     “[HE/SHE]<sub>FOC</sub> saw the child.”

(17) Lexical subject in a subject relative

**xale bi** k-u       gis       Aali  
 child   DEF.SG CM-C<sub>WH</sub> see Ali  
 “the child who saw Ali”

No element can ever intervene between the complementizer and the lexical subject or the subject marker. I therefore posit that the complementizer is located in C, and the lexical subject/subject marker in the specifier of TP, which C takes as its complement.

Subject markers and some allomorphs of C are clitics (Russell 2006), and they undergo various vowel coalescence and/or morpho-phonological fusion processes, depending on the element they are adjacent to. For example, the 3<sup>rd</sup> person singular subject marker is  $\emptyset$  when right-adjacent to *la*, as in (14b), and *mu* when right-adjacent to CM-*u*, as in (15b). Adjacent word-final vowel *i* and the C allomorph *a* become *ee*, shown in (16a), and adjacent *u* and *a* become *oo*, in (16b). We will not concern ourselves with the details of these changes. In all examples, both the underlying form and the surface form of the subject marker and the sentence particle are provided.

### 3 The Cross-Linguistic Typology of A'-movement effects

Before investigating A'-extraction in Wolof in detail, let us take a look at the cross-linguistic properties of A'-extraction effects under investigation, so that we may compare the case of Wolof with other well-known languages and situate it in cross-linguistic typology.

A'-movement causes various morphosyntactic effects in different languages, such as complementizer alternations and subject/non-subject asymmetries. These effects vary in their morphosyntactic form and complexity. Irish has a special complementizer (*aL*) that occurs in case of A'-extraction,

instead of the regular subordinating complementizer *go* (McCloskey 2000, 2001, 2002). It occupies all intermediate C positions between the extraction site and the final landing site, as illustrated in the subject extraction example in (18) (from McCloskey 2002, p.3).

- (18) Cyclicity of A'-extraction in Irish  
 an t-ainm **a** hinnseadh dúinn **a** bhí ar an áit  
 the name *aL* was.told to.us *aL* was on the place  
 “the name that we were told was on the place.”

Wolof’s A'-extraction complementizer allomorph (*l*)*a* also occupies all intermediate C positions along the path of A'-movement, shown in (19):

- (19) Cyclicity of A'-extraction in Wolof  
 L-an **l-a** Aali xam ni **l-a** xale bi gis?  
 CM-Q *l-C<sub>WH</sub>* Ali know that *l-C<sub>WH</sub>* child DEF.SG see  
 “What did Ali know that the child saw?”

The form of the complementizer in Irish and Wolof thus signals the presence of an element with the Wh-feature in its specifier, meaning that it expresses an agreement relationship between C and the *wh*-phrase in its c-command domain.

The complementizer<sup>5</sup> in the Bantu language Kinande also occurs in intermediate extraction sites, but it additionally establishes agreement in class, i.e.  $\varphi$ -features, with the extracted element (Schneider-Zioga 1995, 1996, 2000, 2007), shown in (20a) and (20b) (from Schneider-Zioga 1995, p.71).

- |      |    |   |    |  |
|------|----|---|----|--|
| (20) | a. | <u>Cl 2 agreement in</u><br><u>A'-movement in Kinande</u><br>aBahI <b>BO</b> Yosefu a-langIra?<br>who.2 C.2 Joseph.1 AGR.1-saw<br>“Who did Joseph see?” | b. | <u>Cl 1 agreement in</u><br><u>A'-movement in Kinande</u><br>IyOndI <b>yO</b> Yosefu a-langIra?<br>who.1 C.1 Joseph.1 AGR.1-saw<br>“Who did Joseph see?” |
|------|----|---|----|--|

The form of the Kinande complementizer changes depending on the class of the noun phrase in its specifier, indicating that, in addition to agreement in the Wh-feature, the Kinande complementizer also agrees with the *wh*-phrase in its  $\varphi$ -features. The agreeing complementizer can occur in embedded clauses as well, though this is optional. Crucially, this type of agreement effect is cyclic and long-distance – it is obligatory in every position in which the agreeing complementizer surfaces.

Wolof’s A'-complementizer also exhibits  $\varphi$ -agreement. This type of agreement, however, surfaces

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<sup>5</sup>Schneider-Zioga (2007) analyzes this particle as a focus marker; for the present purposes, this is not relevant.

with a different  $C_{WH}$  allomorph:  $CM-u$ . In (21a) the complementizer surfaces with the singular human class marker  $k-$ , and in (21b) the plural inanimate marker  $y-$ . Agreement of the complementizer in  $\varphi$ -features occurs long-distance: it shows up at the top of the dependency, as in (22).

- (21) a. *k-class agreement in A'-MOVEMENT IN WOLOF*  
**K-u** xale bi gis?  
 CM.SG- $C_{WH}$  child DEF.SG see  
 “Who(*sg*) did the child see?”
- b. *y-class agreement in A'-MOVEMENT IN WOLOF*  
**Y-u** xale bi gis?  
 CM.PL- $C_{WH}$  child DEF.SG see  
 “What(*pl*) did the child see?”

- (22) *Long-distance  $\varphi$ -agreement in A'-movement in Wolof*  
**K-u** Aali xam ni l-a xale bi gis?  
 CM.SG- $C_{WH}$  Ali know that  $l$ - $C_{WH}$  child DEF.SG see  
 “Who(*sg*) did Ali know that the child saw?”

Another type of A'-extraction effect is the *that*-trace effect in English, in which the complementizer exhibits sensitivity to the grammatical relation of the extracted element (Perlmutter 1971; Taraldsen 1979; Kayne 1980; Pesetsky 1982; Rizzi 1990). In case of non-subject extraction, as in (23a), the complementizer *that* can optionally occur in the embedded C position. In case of subject extraction, however, the overt complementizer is prohibited, shown in (23b). Furthermore, the effect is local, present only in the clause in which the extracted element started out (23c).

- (23) *The that-trace effect in English*
- a. What<sub>*i*</sub> does Peet believe (**that**) Rebekah ate *t<sub>i</sub>*?  
 b. Who<sub>*i*</sub> does Peet believe (\***that**) *t<sub>i</sub>* ate the cake?  
 c. Who<sub>*i*</sub> does Peet believe (**that**) Ryan saw (\***that**) *t<sub>i</sub>* ate the cake?

The complementizer allomorph  $(l)a$  in Wolof also shows a local A'-extraction effect, like the *that*-trace effect, by encoding the Case of the extracted phrase: it surfaces as  $(l)a$  in case of non-subject extraction, as in (24a), and as  $a$  in case of subject extraction, as in (24b). The allomorph  $la$  also occupies intermediate Cs and the highest C, like the Irish A'-complementizer  $aL$ . The  $a/la$  asymmetry, however, is only present at the local extraction site.

- (24) *The subject/non-subject asymmetry in Wolof*
- a. L-an **l-a** Aali xam ni **l-a** xale bi gis?  
 CM-Q  $l$ - $C_{WH}$  Ali know that  $l$ - $C_{WH}$  child DEF.SG see  
 “What did Ali know that the child saw?”
- b. K-an **l-a** Aali xam ni mu **a** (>moo) gis xale bi?  
 CM-Q  $l$ - $C_{WH}$  Ali know that 3SG  $C_{WH}$  see child DEF.SG  
 “Who does ali know saw the child?”

Irish, Kinande and English each exhibit an A'-extraction effect. In Irish and Kinande the A'-extraction complementizer agrees with the *wh*-phrase in its c-command domain in the Wh-feature in the former case, or the Wh-feature and the  $\phi$ -feature in the latter case. Since those features are interpretable on the *wh*-phrase, they are *alive* throughout the entire derivation and can participate in agreement with every C that attracts it. The *that*-trace in English, on the other hand, is local: the Case of the extracted phrase is only encoded on the C of the clause in which the extracted element originates. In this paper, I argue that subject/non-subject asymmetries are also an agreement effect, triggered by and uninterpretable T-feature on C.

While complementizers in Irish, Kinande and English each exhibit one type of agreement,  $C_{WH}$  in Wolof shows agreement between C and the *wh*-phrase in the Wh- and  $\phi$ -features, and also C-T agreement. Wolof is not unusual in having more than one A'-extraction effect. Chamorro (Chung 1998) marks A'-extraction in two ways<sup>6</sup> – by complementizer alternation, and by Case-agreement on the verb.<sup>7</sup> The complementizer system of Chamorro is complex; complementizers encode whether the clause is finite or non-finite, interrogative or non-interrogative, matrix or embedded. In A'-extraction, a different set of complementizers occurs, and unlike complementizers in non-extraction clauses, they do not encode any of the characteristics of the clause itself, but alternate depending on the features of the operator in Spec,CP: whether it is a noun phrase or a prepositional phrase, whether the operator is a null relative operator, and whether or not it denotes a location in space or time (examples from Chung 1998, p.224-227).

(25) Wh-complementizer alternations in Chamorro

- a. Hafa  $\emptyset$  malago'-mu?  
what C WH.OBL.want-AGR  
*"What do you want?"*
- b. Ha-uma [ todu yuhi i [  $\emptyset$  kinenne'-ña ] guihan ].  
AGR-carry all that the C WH.OBJ.catch-AGR fish  
*"He carried on his shoulder all the fish he had caught."*
- c. Pues dumimu [ guihi [ änai gaigi si tata-ña yan si nana-ña ] ].  
so AGR.kneel there C AGR.be father-AGR and mother-AGR

<sup>6</sup>Another A'-extraction subject/non-subject asymmetry which Chamorro exhibits is the Anti-Agreement Effect (AAE) (e.g. Ouhalla 1993, 2005; Ouali 2008). In AAEs, the canonical subject-verb agreement is absent from the verb or substituted with default agreement in case of subject extraction. AAE is not reviewed here because it does not have direct bearing on the Wolof case, however, it is worth mentioning, since it is also a local effect, just as all other effects which encode the grammatical relation of the extracted phrase. Therefore, locality seems to be a hallmark of subject/non-subject asymmetries in extraction.

<sup>7</sup>Chung calls this *Wh*-agreement. So as not to confuse it with agreement between  $C^0$  and the *wh*-phrase in the *Wh*-feature, I refer to it as Case-agreement.

- “*So they (du) knelt there where his father and mother were.*”
- d. Ginin hayi na un-risibi katta?  
 from who C AGR-receive letter  
 “*From whom did you receive a letter?*”

It is important to point out that only the highest C alternates in occurrences of A'-movement; the form of intermediate C's is determined by considerations which govern complementizer choice in cases of non-extraction. This is therefore agreement between C and the *wh*-phrase involving the *wh*-phrase's interpretable features.<sup>8</sup>

A'-extraction in Chamorro also triggers special inflectional morphemes on the verb, which encode the grammatical relation of the extracted element (subject, direct object, oblique) (Chung 1998, p.236).

(26) Case-agreement in Chamorro

- a. Ha-fa'gasi si Juan i kareta.  
 AGR-wash Juan the car  
 “*Juan washed the car.*”
- b. Hayi fuma'gasi t i kareta?  
 who WH<sub>[nom]</sub>.wash the car  
 “*Who washed the car?*”
- c. Hafa fina'gasése-nña si Henry t pära hagu?  
 what WH<sub>[obj]</sub>.wash.PROG-AGR Henry for you  
 “*What is Henry washing for you?*”
- d. Hafa pära fa'gase-mmu ni kareta t?  
 what FUT WH<sub>[obl]</sub>.wash-AGR OBL car  
 “*What are you going to wash the car with?*”

This agreement can be present in every clause along the path of the A'-dependency, but only the most embedded verb agrees with the Case of the initial trace; every other verb is inflected for the Case of the intermediate CP. Case-agreement in Chamorro therefore exhibits locality effects and encodes the grammatical relation of the extracted phrase, just like the *that*-trace effect in English and the *a/la* asymmetry in Wolof. Wolof is like Chamorro, in that it has multiple A'-extraction effects. Unlike Chamorro, which realizes them on different elements of the clause (C and the verb/T), in Wolof they all surface on C.

This brief look at the cross-linguistic typology of A'-extraction effects reveals that they can

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<sup>8</sup>The fact that the effect is not cyclic can have various explanations: for example, A'-movement in Chamorro may not be cyclic. We shall see that a similar situation in Wolof can be accounted for by post-syntactic processes.

be divided into two groups, depending on whether they can occur long-distance, or only locally, restricted to the clause out of which the initial extraction takes place. Long-distance effects are the result of the cyclic nature of A'-movement: the *wh*-phrase passes through each Spec,CP position between the extraction and the final landing site and, due to carrying interpretable features (e.g. the Wh-feature and  $\varphi$ -features), can participate in agreement relations in each clause along its movement path. We therefore expect this type of agreement to surface on the C head.<sup>9</sup> Whether agreement occurs of course depends on the feature specification of C and its need to check its uninterpretable features. Local effects, on the other hand, cannot reflect agreement between C and the *wh*-phrase, at least not involving the *wh*-phrase's interpretable features; they must reflect agreement between other elements of the clause. Since they are particular to clauses out of which A'-extraction takes place, it is reasonable to assume that one element participating in this type of agreement is the *wh*-complementizer, which is confirmed by the fact that in some languages they surface on C. In other languages, like Chamorro and languages with Anti-Agreement Effects, they surface on the verb or on T. Following Pesetsky and Torrego (2001), I propose that the subject/non-subject asymmetry in Wolof (and perhaps other languages) is the result of C-T agreement, triggered by the presence of an uninterpretable T-feature on C. We then expect one source of cross-linguistic variation to be the variation in the presence and location of uninterpretable features on different elements of the clause in different languages.

An interesting property of A'-extraction effects in Wolof is that they do not surface simultaneously. Furthermore, the exponent of the complementizer changes as well, depending on the effect that is overt in a particular construction. I argue in §6 that these facts are the result of postsyntactic phenomena: a morphological Obligatory Contour Principle which prohibits identical adjacent  $\varphi$ -features, and adjacency conditions on contextual allomorphy, according to which some morphemes are realized only when adjacent to particular elements. I thereby propose post-syntactic processes to be another possible source of cross-linguistic variation in the realization of A'-extraction effects.

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<sup>9</sup>Cyclic movement is argued to also (or only) pass through Spec,vP (Chomsky 2000; Rackowski and Richards 2005; den Dikken 2009a,b, 2012a,b). Seeing how there is no evidence for this in Wolof, and since the primary goal of this paper is not to provide a comprehensive analysis of extraction effects in general, I do not take vP into account here.

## 4 $\varphi$ -Agreement in C

All *wh*-constructions in Wolof involve an A'-complementizer, which surfaces as *(l)a* or CM-*u*. Both forms signal *wh*-agreement, and the use of one or the other allomorph correlates with Case agreement (i.e. subject/non-subject asymmetry marking) and  $\varphi$ -agreement, respectively.  $C_{WH}$  in Wolof has the feature specification in (27): it has uninterpretable Wh-, T-, and  $\varphi$ -features. It also has an EPP feature, which requires the *wh*-phrase to move to Spec,CP.<sup>10</sup>

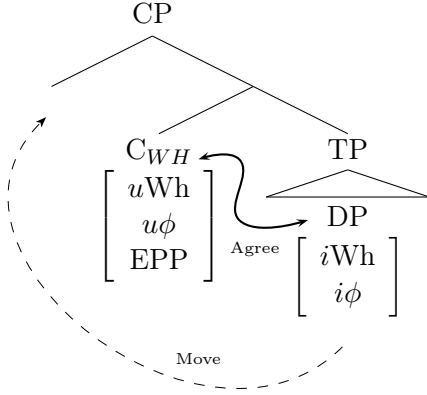
$$(27) \quad \frac{\text{Feature specification of } C_{WH}}{\begin{array}{c} C_{WH} \\ \left[ \begin{array}{c} uWh \\ uT \\ u\phi \\ EPP \end{array} \right] \end{array}}$$

The uninterpretable features are valued via agreement.  $\varphi$ -features on C are always identical to the  $\varphi$ -features of the extracted phrase; they are therefore the result of the Agree operation between  $C_{WH}$  and the *wh*-phrase in its c-command domain, regardless of the distance from the initial extraction site. This type of agreement gives convincing morphological evidence for the cyclicity of A'-movement. For now, we shall not concern ourselves with C-T agreement; this is explored in §5. I therefore omit the T-feature from representations in this section. In §6 I offer an explanation for why the  $\varphi$ -agreement and C-T agreement never surface simultaneously, and why they are tied to different complementizer allomorphs. In this section, we review structures in which the complementizer form exhibits  $\varphi$ -agreement, which I call *u*-constructions. I follow Torrence (2005, 2012a,b) in arguing that CM-*u* signals *wh*-agreement,  $\varphi$ -agreement, and, in some constructions, agreement in definiteness and proximity. The agreement relationship between  $C_{WH}$  and the *wh*-phrase is depicted in (28): C has an uninterpretable Wh- and  $\varphi$ -features, which are valued via Agree by interpretable Wh- and  $\varphi$ -features on the *wh*-phrase. The *wh*-phrase also raises to Spec,CP, due to the EPP feature on  $C_{WH}$ .

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<sup>10</sup>In Pesetsky and Torrego 2001, the EPP feature is a subfeature of other features. In that way, some uninterpretable feature can require to be valued via agreement and movement, while others can be valued solely via agreement. I do not take a stand on this question in this paper, apart from assuming that it is the *wh*-phrase that must move to Spec,CP.

(28)  $\varphi$ -agreement between C and the *wh*-phrase



In long-distance movement, C agrees with the *wh*-phrase situated in Spec,CP of the lower clause. This is possible because the interpretable features on the *wh*-phrase do not get deleted.

In the remainder of this section I review all structures in which CM-*u* surfaces in C and provide evidence for the analysis in (28).

The allomorph CM-*u*, consisting of a class marker and the morpheme *u*, occurs in *wh*-questions, as in (29).<sup>11</sup>

- |   |   |
|---|---|
| <p>(29) a. <u>Subject question with cm-u</u><br/> <b>K-u</b>      gis Musaa?<br/>         CM-C<sub>WH</sub> see Musa<br/>         “Who saw Musa?”</p> | <p>b. <u>Object question with cm-u</u><br/> <b>L-u</b>      Musaa gis?<br/>         CM-C<sub>WH</sub> Musa    see<br/>         “What did Musa see?”</p> |
|---|---|

*Wh*-questions with *u*-forms can be posed about subjects, objects, locatives, manners, and instrumentals, as long as the question corresponds to one simple *wh*-phrase (*who*, *what*, *how*) (Torrence 2005, 2012b). Any *u*-form can be formed with any of the thirteen noun class markers, requiring the answer to contain an item from that noun class. *U*-constructions can occur as matrix questions, as in (29), and embedded questions, as in (30).

- (30) Embedded *Wh*-questions with cm-u  
 Laaj-na-a      Musaa [CP **k-u**      ñu    gis ]  
 ask-C<sub>AFF</sub>-1SG Musa      CM-C<sub>WH</sub> 3PL see  
 “I asked Musa who they saw.”

Noun class marking on CM-*u* may suggest that it is a type of a question word, due to its similarity with the question word CM-*an*, which occurs in questions with the complementizer allomorph (*l*)*a*.

<sup>11</sup> Wolof is a noun class language, like other Atlantic languages, and class membership is usually indicated on DP elements other than the noun, such as articles and demonstratives (Torrence 2005, 2012a,b).



The examples in (31a) and (31b) are equivalent in meaning to (29a) and (29b), respectively.

- (31) a. Subject question with (l)a  
**K-an** a gis Musaa?  
 CM-Q C<sub>WH</sub> see Musa  
 “Who saw Musa?”
- b. Object question with (l)a  
**L-an** l-a Musaa gis?  
 CM-Q l-C<sub>WH</sub> Musa see  
 “What did Musa see?”

However, CM-*u* can never occupy the specifier of (l)a, shown in (32), indicating that CM-*u* forms are not a variant of CM-*an* question words.

- (32) CM-*u* is not a question word  
 \***K-u** a nafar tééré b-i?  
 CM-C<sub>WH</sub> C<sub>WH</sub> read book CM-DEF.PROX

Similarly, CM-*u* cannot occur in questions with a complex *wh*-phrase, either as a determiner in the *wh*-phrase, or as a complementizer. Questions with complex *wh*-phrases can therefore only be formed with the complementizer (l)a, as shown in (33) and (34).<sup>12</sup>

- Questions with a complex wh-phrase
- (33) a. Jaaj-u **k-an l-a** Aali gis?  
 mother-of CM-Q l-C<sub>WH</sub> Ali see  
 “Whose mother did Ali see?”
- b. \*Jaaj-u **k-u** Aali gis?  
 mother-of CM-C<sub>WH</sub> Ali see
- c. \*Jaaj-u **k-u l-a** Aali  
 mother-of CM-C<sub>WH</sub> l-C<sub>WH</sub> Ali  
 gis?  
 see
- (34) a. **B-an** xale **l-a** Faatu gis?  
 CM-Q child l-C<sub>WH</sub> Fatou see  
 “Which child did Fatou see?”
- b. \***B-an** xale **b-u** Faatu gis?  
 CM-Q child CM-C<sub>WH</sub> Fatou see
- c. \***B-u** xale **l-a** Faatu gis?  
 CM-*u* child l-C<sub>WH</sub> Fatou see

Finally, CM-*u* can occupy C at the top of the dependency in long-distance extraction, shown in (35).

- (35) Long-distance extraction with CM-*u*  
**K-u** ñu gëm ni l-a Musaa xalad ni l-a Aali gis?  
 CM-C<sub>WH</sub> 1PL believe that l-C<sub>WH</sub> Musa think that l-C<sub>WH</sub> Ali see  
 “Who do we believe that Musa thinks that Ali saw?”

Based on data such as presented here, and on evidence which shows that *u*-constructions involve A'-movement,<sup>13</sup> Torrence (2005, 2012a,b) argues that CM-*u* is an A'-movement complementizer with

<sup>12</sup>Torrence (2012a) claims that an overt NP in the specifier of CM-*u* can be interpreted as containing a silent *wh*-word, in some dialects (p.169). In the variety of Wolof discussed in this paper, (i) is ungrammatical.

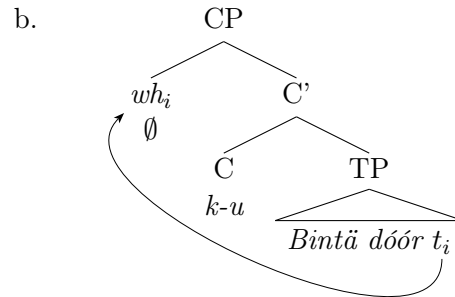
(i) %Picc m-u xale y-i dáq?  
 bird CM-C<sub>WH</sub> child CM.PL-DEF chase  
 “Which bird did the children chase?”

<sup>13</sup>I do not review these arguments here, but see Torrence (2005, 2012a,b) for evidence from reconstruction effects, islands, and Wolof-specific movement tests.

a silent *wh*-phrase in its specifier. According to Torrence, silent nominals exist in each noun class in Wolof. The class marker on the complementizer is a reflex of agreement between the complementizer in C and the silent nominal in Spec,CP. The question in (36a) has the structure in (36b):

*The syntax of CM-u* (Torrence 2012b, p.1157-1158)

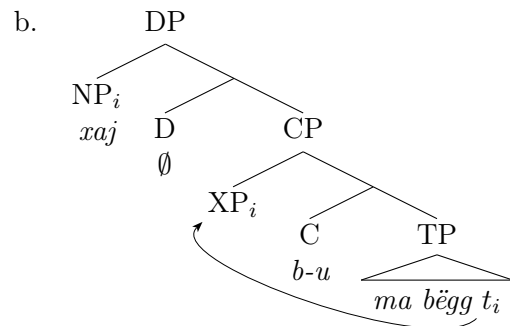
- (36) a. K-u      Bintë dóór?  
          CM-C<sub>WH</sub> Binta hit  
          “Who did Binta hit?”



In addition to questions, CM-*u* also occurs in relative clauses, as in (37a). I argue that Wolof relative clauses have the syntax in (37b): a relative operator co-indexed with the head noun is located in Spec,CP, and the relative CP is the complement of D.

*The syntax of Wolof relative clauses*

- (37) a. Xaj **b-u**      ma bëgg.  
          dog CM-C<sub>WH</sub> 1SG like  
          “a dog that I like”



Torrence (2005, 2012a,b) advocates a structure for Wolof relative clauses in which the relativized DP occurs in Spec,CP, which would make relative clauses different from questions in that they could have an overt phrase in their specifier. He argues for such an analysis because relative clauses exhibit reconstruction effects, suggesting that the relativized DP starts out inside the clause and moves to Spec,CP, binding its trace. This would mean that the complementizer CM-*u* cannot have an overt operator in its specifier in questions, but can have an overt DP in its specifier in relative clauses. It is, however, not necessary for the relativized noun to be inside the relative clause to account for reconstruction effects. Various approaches assume an initially clause-internal position of the head noun, thus making its information available inside the relative clause, but do not require its final

position to be Spec,CP.<sup>14</sup> The exploration of a correct representation of Wolof relative clauses is beyond the scope of this paper. I abstract away from a more precise representation and leave it for further research and assume (37b) as a tentative structure of Wolof relative clauses, maintaining the parallel between questions, which in Torrence’s analysis have an empty *wh*-operator in Spec,CP, and relative clauses, which along the same lines would have an empty relative operator in Spec,CP. In §6 I propose that it is not the case that Wolof possesses silent nominals which only occur in the specifier of CM-*u*, and which are only selected for by CM-*u*, but that the operator in Spec,CP is deleted under featural identity with C, as a result of a morphological Obligatory Contour Principle.

Another structure in which CM-*u* occurs are temporal clauses and conditionals. Temporal clauses are a type of relative clause (Torrence 2012a), with two differences: there is no head noun, and a suffix *-ee*<sup>15</sup> obligatorily occurs on the verb. This suffix appears when an adjunct undergoes movement, so its obligatoriness in temporal and conditional clauses indicates that a relative operator introduced as an adjunct A’-moves to Spec,CP. The complementizer can surface with three class markers, *b*-, *s*- and *f*-. Conditionals are similar, except they only contain CM-*u* forms with *b*- and *s*-class markers. The following examples are from Torrence 2012a (p. 209):

(38) *Temporal and conditional clauses in Wolof*

- a. **B-u**      ñu lekk-ee    ceeb, di-na-ñu                    nelaw.  
CM-C<sub>WH</sub> 3PL eat-PERF rice IMPERF-C<sub>AFF</sub>-3PL sleep  
*“When they eat rice, they sleep.”/ “When they eat rice, they will sleep.”*
- b. **S/B-u**    gis-ée      Ayda, di-na-a-ko                    nuyu.  
CM-C<sub>WH</sub> see-PERF Ayda IMPERF-C<sub>AFF</sub>-1SG-3SG<sub>OBJ</sub> greet  
*“If I see Ayda, I will greet her.”*

The fact that CM-*u* in temporal (and conditional) clauses also exhibits what appears to be class agreement, with nominals from the *b*-, *s*- and *f*- class, suggests that their structure is equivalent to that of relative clauses, and that they involve A’-movement of a temporal nominal to Spec,CP (Torrence 2005, 2012a,b). Since temporal and conditional clauses are a type of relative clauses, in the remainder of the paper I restrict the discussion to relative clauses, assuming that the analysis

<sup>14</sup>For example, in the *matching* analysis (Lees 1960, 1961; Chomsky 1965; Sauerland 1998, 2003 among others) an external head takes the relative CP as a complement, and an internal head corresponding to the external head is located in Spec,CP. Another proposal is the *head raising* analysis (e.g. Brame 1968; Schachter 1973; Vergnaud 1974; Áfarli 1994; Kayne 1994; Bhatt 1999, 2002), according to which the head NP originates inside the relative clause, but is not necessarily located in Spec,CP in the final structure (its final position varies in different analyses).

<sup>15</sup>Torrence glosses this suffix as perfective, and Robert (2006) and Perrin (2008) call it the anterior suffix.

extends to temporal and conditional clauses.

In the final part of this section, I discuss an additional property which the *wh*-complementizer exhibits in relative and temporal clauses. Namely, it appears that in those structures C agrees with the head noun not only in class, but also in definiteness in proximity. This additional featural content of the complementizer will be relevant for the analysis of the distribution of CM-*u* and (*l*)*a* in §6.

Aside from CM-*u*, this allomorph of C has two more variants in relative and temporal clauses, CM-*i* and CM-*a*. Determiners have similar forms in Wolof, *u*-CM/*a*-CM being the indefinite one, and CM-*i* and CM-*a* the definite ones, with the former denoting a spacially proximal entity, and the latter a distal one. In the variety of Wolof analyzed in this paper, the indefinite article is *a*-CM. It is usually omitted.<sup>16</sup>

- (39) a. *Indefinite determiner*  
           **a-b**                xaj  
           INDEF-CM.SG dog  
           “*a dog*”
- b. *Definite proximal determiner*  
           xaj **b-i**  
           dog CM.SG-DEF.PROX  
           “*the (proximal) dog*”
- c. *Definite distal determiner*  
           xaj **b-a**  
           dog CM.SG-DEF.DIST  
           “*the (distal) dog*”

The vowels in the complementizer have a similar function: CM-*u* is an indefinite relative marker, and CM-*i* and CM-*a* definite ones, denoting that the head of the relative clause is proximal or distal, respectively, in space, time, or discourse (Torrence 2012a). In my data, CM-*a* usually requires the use of the past tense morpheme on the verb, and indicates that the situation in question is removed in time from the moment of speaking.<sup>17</sup> It must also be pointed out that the determiner of the DP

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<sup>16</sup>Wolof is for the most part a head-initial language. Interestingly, it has a mixed determiner system, where the indefinite determiner is pre-nominal, and definite determiners post-nominal.

<sup>17</sup>The three versions of this complementizer differ in their distribution. Only CM-*u* can be used in questions, and only CM-*i* in certain free relative constructions (Caponigro and Heller 2007). In this paper, I am disregarding these distributional facts, though the definiteness of the complementizer plays an important role in my analysis, discussed in §6.

containing the head noun and the relative marker normally do not co-occur, shown in (40).<sup>18</sup>

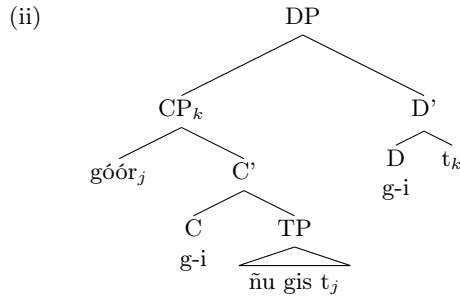
(40) Relative clauses and definite determiners in Wolof

- a. (\*a-b)      xaj **b-u**      ma bëgg  
INDEF-CM dog CM-C<sub>WH</sub> 1SG like  
“a dog that I like”
- b. xaj (\*b-i)      **b-i**      ma bëgg  
dog CM-DEF.PROX CM-C<sub>WH</sub> 1SG like  
“the dog (here) that I like”
- c. xaj (\*b-a)      **b-a**      ma bëgg-oon  
dog CM-DEF.DIST CM-C<sub>WH</sub> 1SG like-PST  
“the dog (there) that I liked”

It appears that CM-*u/i/a* in relative clauses signals not just agreement in noun class, but also in definiteness and proximity. It could be proposed that a morpho-phonological process (fusion or deletion) ensures that the the determiner and the complementizer do not both surface next to each other, due to their phonological similarity, and that what surfaces is the determiner, carrying the definiteness feature. While this could explain examples (40b) and (40c), where the determiners and the complementizer are next to each other and have identical phonological form, it cannot account for the absence of the indefinite determiner in (40a), which is prenominal, and which differs in form from the complementizer.<sup>19</sup> I therefore propose that C in relative clauses carries the definiteness

<sup>18</sup>According to Torrence (2012a,b), the determiner can optionally surface on the edges of the relative clause, as in (ia). He therefore argues that the head noun originates in object position following the verb, raises to Spec,CP, and then the entire CP raises to Spec,DP. This is illustrated in (ii) (examples from Torrence 2012a, p.103-104).

- (i) góór g-i ñu gis (g-i)  
man CM-*i* 3PL see CM-DEF.PROX  
“the man that they saw”



In the variety of Wolof analyzed in this paper, the occurrence of the determiners on the edges of the relative clause is not possible. Regardless, my analysis does not hinge on the exact position of the determiner.

<sup>19</sup>It also cannot account for Torrence’s data, in which the determiners can optionally surface on the edges of relative clauses.

feature, which it obtains from the determiner through agreement. For present purposes, I assume that definiteness is part of the  $\varphi$ -feature complex which participates in  $\varphi$ -agreement.

The fact that the definiteness feature does not surface twice is reminiscent of a similar phenomenon in some Scandinavian languages. In Wolof, the two heads, D and C, agree in  $\varphi$ -features, definiteness and proximity. As a result, the determiner and the complementizer have identical feature specifications. I propose that in such a case only one of the two heads can be pronounced, and that in this configuration in Wolof, it is the lower one. The determiner is therefore deleted. That this analysis is on the right track is corroborated by data in Torrence 2012a,b, where in some dialects the determiner can optionally surface on the edges of the relative clause. Such variation is expected in the scenario sketched above: in some dialects the expression of identical features in two different heads is prohibited, in others it is not. A similar restriction exists in some Scandinavian languages (Embick and Noyer 2001; Hankamer and Mikkelsen 2002, 2005, among others), where the definite feature can occur in two positions inside the DP – as a suffix on the noun, or as an article, depending on the presence or absence of adjectival modifiers. In some languages, for example in Danish, the definite determiner can only be expressed once. Swedish and Norwegian, on the other hand, exhibit the phenomenon of Double Definiteness, whereby the presence of a modifier requires the definite feature to surface both as an article, and as a suffix on the noun. The variation in the expression of definiteness in Wolof is similar: in some dialects it can only be expressed on one head, while other dialects allow the determiner to optionally surface on the edges of the relative clause. The details of this proposal are left for future research.

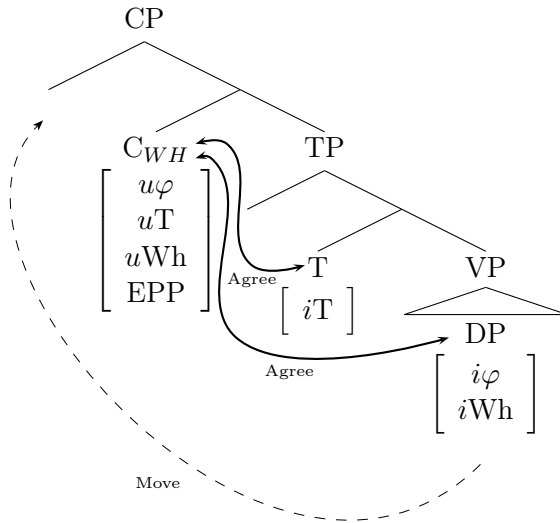
In this section I reviewed evidence argued for in Torrence 2005, 2012a,b that  $CM-u$  signals agreement in Wh- and  $\varphi$ -features between  $C_{WH}$  and the *wh*-phrase. I proposed more specifically that the agreement relationship is established between C and the *wh*-phrase in its c-command domain due to uninterpretable Wh- and  $\varphi$ -features on C. As a result of the EPP feature on C, the *wh*-phrase raises to Spec,CP. I argue, with Torrence, that this phrase is phonologically null in *u*-constructions. I furthermore extend this analysis to relative clauses and argue that they as well have a null operator in Spec,CP, and furthermore, that the part of the  $\varphi$ -feature bundle in  $C_{REL}$  is definiteness and proximity. In relative clauses, therefore, C carries all the  $\varphi$ -features of D, leading to the deletion of D, in order to prevent the definiteness feature from surfacing on both D and C, similar to the ban on Double Definiteness in Scandinavian.

In the following section, I argue that  $(l)a$  must be treated on a par with  $CM-u$ : as an allomorph of  $C_{WH}$ .

## 5 Case-Agreement in C

The second allomorph of the *wh*-complementizer is  $(l)a$  (Author, 2013). In addition to *wh*-agreement, it exhibits Case agreement, signaling whether the extracted element is a subject or a non-subject. As all Case-agreement effects in A'-extraction, described in §3, this effect is local: it surfaces only in the clause in which the *wh*-phrase originated. This means that this agreement is different from agreement with the *wh*-phrase, which can be long distance, since the phrase carries interpretable features that can participate in agreement in each phase through which the *wh*-phrase cyclically moves. Locality of agreement indicates that some C's uninterpretable feature is not valued by an interpretable feature of the *wh*-phrase. I follow Pesetsky and Torrego's (2001) analysis of the *that*-trace effect and propose that C has an uninterpretable T-feature (in addition to  $u\varphi$  and  $uWh$ ), and that the subject/non-subject asymmetry is a reflex of T-C agreement.<sup>20</sup> (41) gives the schematics of C's agreement pattern.

(41) C-T Agreement



The subject/non-subject asymmetry in Wolof is illustrated in (42) and (43). In instances of subject extraction the A'-moved phrase is followed by *a*, and in object extraction by *la*. Example

<sup>20</sup>Agreement between C and T has been proposed as an account of two other subject/non-subject asymmetries: Case-agreement in Chamorro (Chung 1998) and Anti Agreement Effects in Bantu (Henderson 2013).

(44) illustrates the locality of the *a/la* asymmetry: in extraction of an embedded subject, *a* is found at the local extraction site, and *la* in every intermediate clause and at the final landing site.<sup>21</sup> I call all constructions with *(l)a* *a*-constructions.

- |   |   |
|---|---|
| <p>(42) <u>Subject extraction with (l)a</u><br/> Aali <b>a</b>      gis Musaa<br/> ali   C<sub>WH</sub> see Musa<br/> “[ALI]<sub>FOC</sub> saw Musa.”</p> | <p>(43) <u>Non-subject extraction with (l)a</u><br/> Musaa <b>l-a</b>      Aali gis<br/> Musa   l-C<sub>WH</sub> ali   see<br/> “Ali saw [MUSA]<sub>FOC</sub>.”</p> |
|---|---|
- 
- (44) Long-distance extraction with (l)a  
Aali **l-a-a**      gëm    ni    **l-a**    Musaa xalad ni    mu **a** (>moo) leen      gis  
Ali   l-C<sub>WH</sub>-1SG believe that l-C<sub>WH</sub> Musa   think that 3SG C<sub>WH</sub>      3PL.OBJ see  
“*I believe that Musa thinks that [ALI]<sub>FOC</sub> saw them.*”

The fact that this allomorph of C<sub>WH</sub> surfaces with an extra element, *l-*, in case of non-subject extraction, which is absent in subject extraction, suggests that its presence in C and the presence of a locally extracted subject in Spec,CP fulfils the same function. I argue that this function is to check *uT* on C. In that view, *l-* is the morphological reflex of T which moves to C in non-subject extraction. In subject extraction T-to-C movement does not happen, because the local subject carries a valued T-feature in the form of its Nominative Case. Since valued uninterpretable features are available for further operations within the same phase, the extracted subject can check all of C’s uninterpretable features: *uWh*, *uT* and *uφ*, and economy prevents T-to-C movement. The extracted subject can only value *uT* of the local C: its own valued *uT* must delete at the end of the phase, meaning that *uT* in every higher C must be checked via T-to-C movement. This is why the subject/non-subject asymmetry is local.

Before offering a detailed analysis of the subject/non-subject asymmetry as T-C agreement, I provide arguments that *(l)a* is an A'-agreement complementizer, and that it should be treated as

<sup>21</sup> Torrence (2012b) claims that the complementizer CM-*u* exhibits the same behavior, i.e. that it occupies intermediate C positions in long-distance extraction, shown in (i). Furthermore, he gives examples of *mixed chains*, in which CM-*u* and *(l)a* can alternate along the path of A'-movement, as in (ii) (example from Torrence 2012b, p.1173):

- (i) **K-u**    Kumba wax ne    **k-u**    Isaa defe ne    **k-u**    Maryam di      dóór?  
CM-C<sub>WH</sub> Kumba say that CM-C<sub>WH</sub> Isa   think that CM-C<sub>WH</sub> Maryam AUX.FUT hit  
“Who did Kumba say that Isa thought that Maryam will hit?”
- (ii) **K-u**    Kumba wax ne    **l-a**    Isaa defe ne    **k-u**    Maryam di      dóór?  
CM-C<sub>WH</sub> Kumba say that l-C<sub>WH</sub> Isa   think that CM-C<sub>WH</sub> Maryam AUX.FUT hit  
“Who did Kumba say that Isa thought that Maryam will hit?”

In the variety of Wolof analyzed in this paper, the CM-*u* complementizer in intermediate C positions is ungrammatical. However, taking Torrence’s data into account can only strengthen my proposal to treat *(l)a* and CM-*u* as allomorphs of C<sub>WH</sub>.



an allomorph of CM-*u* in 5.1. In 5.2 I give an overview of Pesetsky and Torrego 2001 and show how it can be applied to the Wolof data in 5.3.

### 5.1 *(l)a* as an A'-movement complementizer

I propose that the *a*-construction in (45a) has the structure in (45b), which parallels the syntax of *u*-constructions, shown in example (36).

- (45) The syntax of *(l)a*
- a. K-an l-a Bintë dóór?  
 CM-Q *l*-C<sub>WH</sub> Binta hit  
 “Who did Binta hit?”
- b.

In this section, I build upon Author (2013) and show that the properties of *a*-constructions can be understood only if they are treated as A'-movement constructions, on a par with *u*-constructions. This analysis is supported by the data which show that *(l)a* obligatorily occurs in all instances of long-distance extraction and that it is incompatible with any other complementizer-like element, including CM-*u*, which is expected if they occupy the same position in the clause.

Questions with *(l)a* involve movement of the question word to the specifier of *(l)a*. The question word consists of a class marker and the morpheme *-an*. The subject question word in (46a) contains the human class marker *k-*, and the verb complement question word in (46b) the default inanimate class marker *l-*. Torrence (2005, 2012a) notes that there is no interpretative difference between (46a) and (46b) and identical questions formed with CM-*u*, as in (29a) and (29b), which is consistent with my findings.

- Question words in *a*-constructions
- (46) a. **K-an** a gis Musaa?  
 CM-Q C<sub>WH</sub> see Musa  
 “Who saw Musa?”
- b. **L-an** l-a Musaa gis?  
 CM-Q *l*-C<sub>WH</sub> Musa see  
 “What did Musa see?”

Just as the complementizer CM-*u*, question words can be formed with any of the thirteen class markers, requiring the answer to contain a noun that is a member of a particular class. Like *u*-constructions (example (30)), *a*-constructions can also be found in embedded questions, as in (47).

- (47) Embedded question with (l)a  
 Laaj-na-a Musaa [<sub>CP</sub> **k-an l-a**-ñu gis ]  
 ask-C<sub>AF</sub>F-1SG Musa CM-Q l-C<sub>WH</sub>-3PL see  
*“I asked Musa who they saw.”*

The allomorph *(l)a* also occurs in focus constructions and comparatives.<sup>22</sup> Focus constructions in Wolof involve fronting of the focused constituent, which is obligatorily followed by *(l)a*:

- (48) Object focus in Wolof  
 Tééré bi **l-a** Osmaan nafar.  
 book DEF.SG l-C<sub>WH</sub> Osman read  
*“Osman read the [BOOK]<sub>FOC</sub>.”*

Wolof comparatives are formed with the verb *gën* ‘surpass’, which commonly combines with a gradable stative verb introduced by a verbal linker *a-* (Baglini to appear). Crucially, comparatives involve obligatory movement of the target of comparison to the specifier of *(l)a* (examples from Baglini to appear):

- (49) Comparatives in Wolof
- a. Ma-**a** gën-a-bëgg djënn Binta.  
 1SG-C<sub>WH</sub> surpass-a-like fish Binta  
*“I like fish more than Binta (does).”*
  - b. Ginaar **l-a**-a gën-a-bëgg ci djënn  
 chicken l-C<sub>WH</sub>-1SG surpass-a-like P fish  
*“I like chicken more than fish.”*

Another property of *(l)a* is that it obligatorily occurs in long-distance movement; extraction out of an embedded clause that contains a different sentence particle is not possible (Dunigan 1994). The example in (50b) illustrates an attempt at extraction out of an embedded clause with the verb-focus particle *da*. Extraction is equally ungrammatical with an *a*-construction and an *u*-construction in the matrix clause, if the embedded clause retains the particle *da*. Long distance extraction out of the sentence in (50a) is only possible if *(l)a* occupies the embedded C, as in (50c).<sup>23</sup>

<sup>22</sup> In addition, *(l)a* occurs in copular sentences, as in (i).

- (i) Osmaan ndongo **l-a**-∅.  
 Osman student l-C<sub>WH</sub>-3SG  
*“Osman is a student.”*

I do not discuss them in this paper, because their syntax is more complex. In Author to appear(a), I present evidence that they involve A'-movement of a DP to the specifier of *(l)a*.

<sup>23</sup> This also means that the semantic properties of different sentential particles cannot be preserved in extraction. I have nothing more to say about this here, though it is certainly a matter which warrants further investigation.

(50) Extraction out of an embedded verb focus sentence

- a. Moodu xam ni Faatu da-fa gis gainde.  
 Modu know that Fatou  $C_{PRED.FOC}$ -3SG see lion  
*“Modu knows that Fatou [SAW]<sub>FOC</sub> a lion.”*
- b.  $\{*L\text{-an } l\text{-a}\}/\{*L\text{-u}\}$  Modu xam ni Faatu da-fa gis?  
 $\{CM\text{-Q } l\text{-C}_{WH}\}/\{CM\text{-C}_{WH}\}$  Modu know that Fatou  $C_{PRED.FOC}$ -3SG see  
*Intended: “What does Modu know that Fatou [SAW]<sub>FOC</sub>?”*
- c.  $\{L\text{-an } l\text{-a}\}/\{L\text{-u}\}$  Moodu xam ni **l-a** Faatu gis?  
 $\{CM\text{-Q } l\text{-C}_{WH}\}/\{CM\text{-C}_{WH}\}$  Modu know that  $l\text{-C}_{WH}$  Fatou see  
*“What does Modu know that Fatou saw?”*

Similarly, the allomorph of C which signals  $\phi$ -agreement,  $CM\text{-}u$ , cannot occur in embedded clauses. The following examples illustrate this in *u*-questions, relative clauses, and temporal clauses, none of which contain *(l)a* if there is no long-distance extraction.

(51) *u*-Questions

- a. K-u lekk gato bi?  
 $CM\text{-C}_{WH}$  eat cake DEF.SG  
*“Who ate the cake?”*
- b. K-u Musaa foog mu-**a** lekk gato bi  
 $CM\text{-C}_{WH}$  Musa think 3SG- $C_{WH}$  eat cake DEF.SG  
*“Who does Musa think ate the cake?”*

(52) Relative Clauses

- a. film bi ñu bëgg  
 movie DEF.SG 1PL like  
*“the movie we liked.”*
- b. film bi mu wax-oon ni **l-a**-ñu bëgg  
 movie DEF.SG 3SG say-PAST that  $l\text{-C}_{WH}$ -1PL like  
*“the movie that s/he said we liked”*

(53) Temporal Clauses

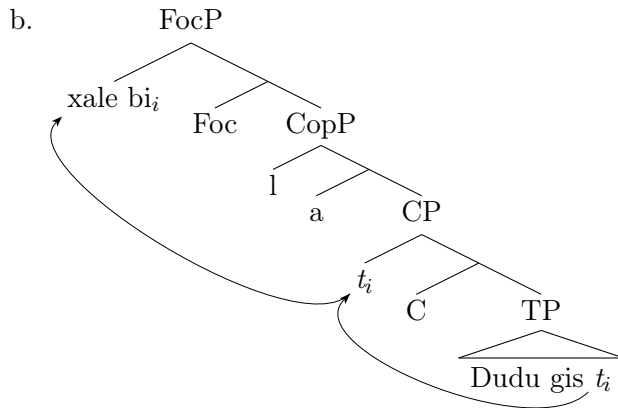
- a. Ndax yaangi doon lekk b-i Aali lekk-ee cere?  
 Q 2SG-PRES.FOC IMPF.PAST eat  $CM\text{-C}_{WH}$  Ali eat-PERF couscous  
*“Were you eating at the time Ali had eaten couscous?”*
- b. Ndax yaangi doon lekk b-i Faatu wax-oon ni **l-a** Aali  
 Q 2SG-PRES.FOC IMPF.PAST eat  $CM\text{-C}_{WH}$  Fatou say-PAST that  $l\text{-C}_{WH}$  Ali  
 lekk-ee cere?  
 eat-PERF couscous  
*“Were you eating at the time Fatou said Ali had eaten couscous?” (embedded reading)*

In this respect, *(l)a* is similar to the Irish complementizer *aL*, and provides evidence for the cyclic nature of A'-movement.

At this point, I would like to briefly address a different analysis of *(l)a*, in particular the proposal by Torrence (2005, 2012a,b, to appear), who treats it as a raising verb, occurring in a copula projection, and all constructions in which it occurs as clefts. For Torrence, the *a*-construction in (54a) has the syntax in (54b):

(54) *(l)a as a copula* (Torrence 2005, p. 271)

- a. Xale bi l-a Dudu gis?  
 child DEF.SG *l*-C<sub>WH</sub> Dudu see  
 “Dudu saw the [CHILD]<sub>FOC</sub>?”



This approach is in great part due to the fact that *(l)a* also occurs in copular constructions (see footnote 22). I do not explore the syntax of copular sentences here (but see Author to appear(a), to appear(b)), however, it is necessary to stress that the occurrence of *(l)a* in copular sentences does not automatically imply that it is a copula. It is not uncommon for elements other than the copula (e.g. focus markers in African languages, as in Hausa, Green 2007) to appear in copular sentences. More importantly, *(l)a* in no way behaves like a verbal element in Wolof. First of all, it does not occupy a position inside the VP, but occurs in a projection above the TP. Second, it is in complementary distribution with all other sentence particles (i.e. complementizer-like elements), which is unexpected, if indeed *(l)a* is in a clause above the CP, which it takes as its complement; it should allow the occurrence of other sentence particles in the complement clause. Instead, under Torrence’s analysis, C must always be empty, disallowing even the relative complementizer CM-*u*. In sum, the CP which the copula *a* presumably takes as its complement does not look like any other

CP in Wolof. Furthermore, under the clefting analysis, the clause above the CP is another clause, which also lacks a sentence particle and does not resemble any clause type in Wolof, particularly not copular clauses, which, when containing *la*, must move both DPs in front of it, illustrated in footnote 22. These facts, in addition to the parallels between constructions with CM-*u* and *(l)a*, reinforce the analysis which treats both elements as being realizations of the same A'-complementizer.

In the following two sections, I return to the subject/non-subject asymmetry and offer an analysis which treats it as a T-C agreement phenomenon, building on Pesetsky and Torrego's (2001) account of the *that*-trace effect. In 5.2, I review the relevant elements of their analysis, and in 5.3 I apply it to Wolof.

## 5.2 Pesetsky & Torrego (2001)

Pesetsky and Torrego (2001) (henceforth P&T) offer a unified analysis of the T-to-C asymmetry and the *that*-trace effect in English, that rests on two assumptions: (i) T-to-C movement is motivated by an uninterpretable T feature (*uT*), with an EPP feature, on C, and (ii) Nominative case is *uT* on D. The relevant principles for the analysis are the following:

1. ATTRACT CLOSEST (Chomsky, 1995): only the closest constituent can be attracted.
2. HEAD MOVEMENT GENERALIZATION: the movement from a complement to the nearest head is always realized as head movement.
3. PRINCIPLE OF MINIMAL COMPLIANCE (Richards, 1997): a constituent that is farther away may be extracted, if an element that complies with ATTRACT CLOSEST has already moved.

The key data for their analysis is the T-to-C asymmetry illustrated in (55), and schematized in (56) (the schema shows the structures before T-to-C has taken place):

(55) *T-to-C asymmetry in English*

- a. What did Mary buy?
- b. \*What Mary bought?
- c. \*Who did buy the book? (unless *did* is focused)
- d. Who bought the book?

- (56) a. [<sub>C</sub> *uT*, *uWh*] [<sub>TP</sub> [ Mary, *uT*] T [<sub>VP</sub> bought what] ] (55a)-(55b)  
b. [<sub>C</sub> *uT*, *uWh*] [<sub>TP</sub> [ who, *uT*] T [<sub>VP</sub> bought the book] ] (55c)-(55d)

In (56), the nominative subject is already attracted to Spec,TP by T's need to check its uninterpretable  $\phi$ -features.  $uT$  on the subject is also marked for deletion by agreement with  $iT$  on T; however, this feature may remain undeleted until the end of the CP cycle, and be accessible to further operations. P&T explain the lack of T-to-C movement in subject extraction (55d), and its occurrence in object extraction (55a) in the following way. C bears  $uWh$  and  $uT$ , with an EPP feature. In (56a), the closest element that bears a Wh-feature is *what*, but both the nominative subject and T (which carry  $uT/iT$ ) are closer to C than *what*. Attracting the TP results in head movement of T to C, due to the Head Movement Generalization, and the object A'-moves to delete C's uninterpretable Wh-feature. C is thus forced to delete its uninterpretable features in two separate operations.

Turning to (56b), TP and its nominative specifier both count as the closest constituent to C, so, in principle, C can choose to delete its  $uT$  feature by attracting TP (realized as head movement), or by attracting the specifier. If it attracts T, it deletes just one of its two uninterpretable features. If, on the other hand, it attracts the nominative phrase, both  $uT$  and  $uWh$  can be deleted in one step, since the phrase in Spec,TP has both features. The ECONOMY CONDITION prevents unnecessary movement to take place, and bans T-to-C.

P&T extend this analysis to account for the *that*-trace effect in English, which is similar to the T-to-C asymmetry in that in both cases subject extraction prevents a word from occurring in C, that is found there when non-subjects are extracted. To account for the effects in (57), P&T claim that *that* is not C, as is usually assumed, but an instance of T that has moved to C.

(57) The that-trace effect in English

- a. Who did John say will buy the book?
- b. \*Who did John say that will buy the book?

The reason why (57b) is not possible is the same one that prevents T-to-C in sentences like (55c): the nominative *wh*-phrase deletes both  $uT$  and  $uWh$  on C.

- (58) a. \*Who<sub>i</sub> did John say [<sub>CP</sub> *t*[*who*, +*wh*,  $uT$ ]<sub>i</sub> [<sub>T</sub> *that*]<sub>j</sub>+ [C,  ~~$uT$~~ ,  ~~$uWh$~~ ] [<sub>IP</sub> *t*-who<sub>i</sub> will<sub>j</sub> buy the book]]?
- b. Who<sub>i</sub> did John say [<sub>CP</sub> *t*[*who*, +*wh*,  $uT$ ]<sub>i</sub> [C,  ~~$uT$~~ ,  ~~$uWh$~~ ] [<sub>IP</sub> *t*-who<sub>i</sub> will<sub>j</sub> buy the book]]?

It follows that when the extracted element is not the subject, *that* should be optional, since in those

cases, both TP and its specifier (the subject) bear a  $uT$  feature, and both are equally close to C. This is precisely what we see in long distance object extraction:

(59) Long distance object extraction in English

What did Sue say [<sub>CP</sub> (that) Mary will buy ]?

Under this account, the optionality of *that* in embedded declaratives, as in (60), is also expected. Furthermore, since a declarative C does not bear  $uWh$ , economy considerations are not important. This is why both (60a) and (60b) are possible.

(60) Optionality of *that* in embedded declaratives

- a. Mary thinks that Sue will buy the book.
- b. Mary thinks Sue will buy the book.

If C has the option of deleting its  $uT$  either by attracting the subject or by attracting TP in (60), the question arises why this is not possible in object extraction in matrix questions, i.e., why both (61a) and (61b) are not well-formed:

(61) Matrix object questions

- a. What did Mary buy?
- b. \*What Mary bought?

P&T claim that this is in fact a possibility, but that in English this happens to have consequences on interpretation. According to their analysis, if a C with  $uWh$  has a non-*wh*-phrase as a specifier, the clause is interpreted as an exclamative. This is illustrated by examples that support exclamative interpretation, as in (62):

(62) Non-*wh*-phrase in Spec,CP results in exclamative interpretation

- a. \*What a silly book did Mary buy!
- b. What a silly book Mary bought!

This predicts that it should not be possible to form an exclamative if the moved *wh*-phrase is the nominative subject – if the closest constituent that carries  $uT$  and  $uWh$  is the same phrase, no non-*wh*-phrase can move to Spec,CP, and the exclamative interpretation will be unavailable. This is the pattern we find:

(63) Nominative subject as the exclamative phrase

\*What a silly person just called me on the phone!

With the sketch of Pesetsky and Torrego’s analysis in mind, let us now turn to Wolof and see how it can be used to account for the subject/non-subject asymmetry in Wolof *a*-constructions.

### 5.3 T-to-C in Wolof

The subject/non-subject asymmetry in Wolof is exhibited with the *A'*-complementizer allomorph *(l)a*, which surfaces as *a* in case of local subject extraction, and as *la* in all other C positions, and bears resemblance to the English *that*-trace effect. In this section, I follow Pesetsky and Torrego’s (2001) proposal that this asymmetry in English is the result of an agreement relationship between C and T, established due to the fact that C carries an uninterpretable T feature. I claim that *l-* which precedes *a* in all instances of *A'*-movement in *a*-structures in Wolof, except in case of local subject extraction, is the morphological realization of T that has moved to C. The details of the analysis are as follows.

I proposed in previous sections that C, in addition to having an uninterpretable Wh- and  $\varphi$ -features, also has a *uT* feature. Adopting P&T’s assumption that nominative case is *uT* on D, we expect the sentence in (64a) to have the structure in (64b), before the movement of the focused phrase:

(64) Subject extraction

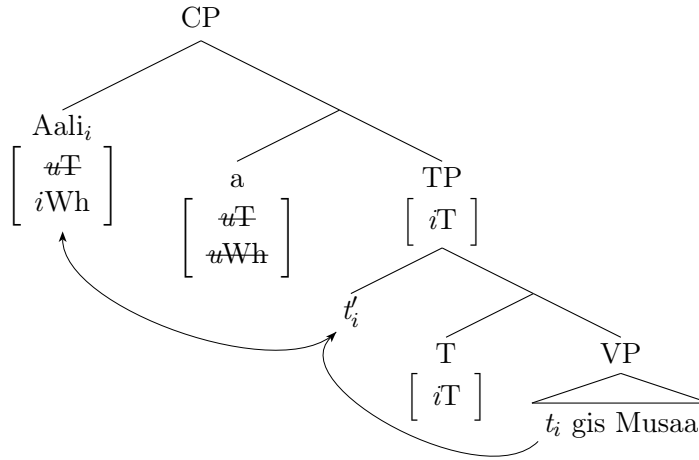
- a. Aali **a** (>Aalee) gis Musaa.  
     Ali C<sub>WH</sub>           see musa  
     “[ALI]<sub>FOC</sub> saw Musa.”

- b. [C a<sub>uT, uWh</sub>] [TP [Aali<sub>uT, iWh</sub>] iT [VP gis Musaa]]

The subject in (64b) has both *uT*, and *iWh*, so by attracting it, C can delete both of its uninterpretable features in one operation, yielding the structure in (65):



(65) Subject extraction as  $uT$  valuation



On the other hand, if a non-subject is extracted, as in (66), the extracted constituent has only the  $iWh$  feature. The structure after C has merged with TP is shown in (66b).

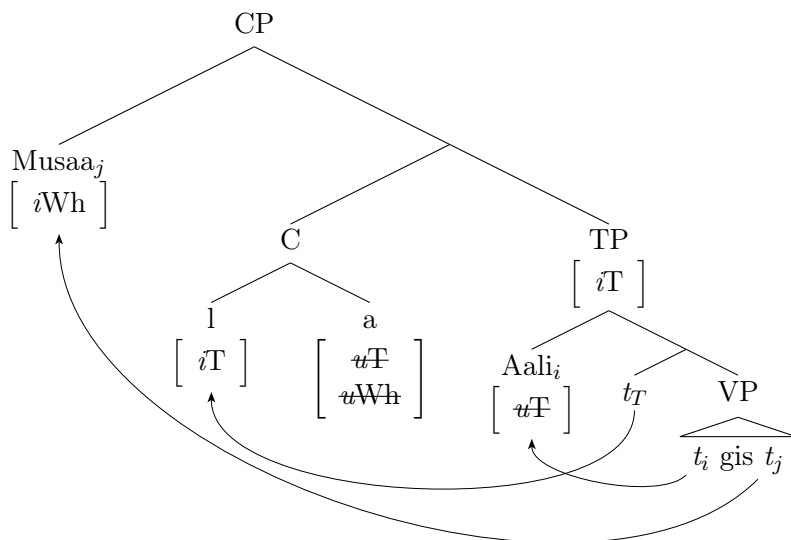
(66) Object extraction

- a. Musaa **l-a** Aali gis  
 musa l- $C_f$  ali see  
 “Ali saw [MUSA]<sub>FOC</sub>.”

- b. [C  $a_{uT, uWh}$ ] [TP [Aali<sub>uT</sub>] iT [VP gis Musaa<sub>iWh</sub>]]

Both the subject and T are closer to C than the object, so ATTRACT CLOSEST forces C to delete one of its uninterpretable features ( $uT$ ) by attracting the closest constituent. However,  $uWh$  can only be deleted by attracting the object DP. Therefore, C needs two movement operations to delete all of its uninterpretable features. The key to this proposal is that  $l-$  is the spell-out of T that has moved to C, as shown in (67).

(67) T-to-C in object extraction



We now have an account of the *a/la*-asymmetry as a T-to-C asymmetry: the result of the ability of the subject phrase to check *uT* on C, due to the fact that it carries Nominative Case. Seeing how C in local subject extraction differs from C in any other position by not having *l-* prefixed to it, the parallel between the function that *l-* performs and the function that an extracted subject in Spec,CP performs is hereby accounted for in a natural way.

A question that needs addressing is why C in sentences like (66) cannot choose between Spec,TP and TP (i.e. its head), to delete *uT*? In other words, why is the sentence in (68) not a possible way to focus an object?

(68) Subject movement to Spec,CP in object extraction

\*Musaa Aali **a** (<Aalee) gis  
 Musa Ali C<sub>WH</sub> see  
 intended: “Ali saw [MUSA]<sub>FOC</sub>.”

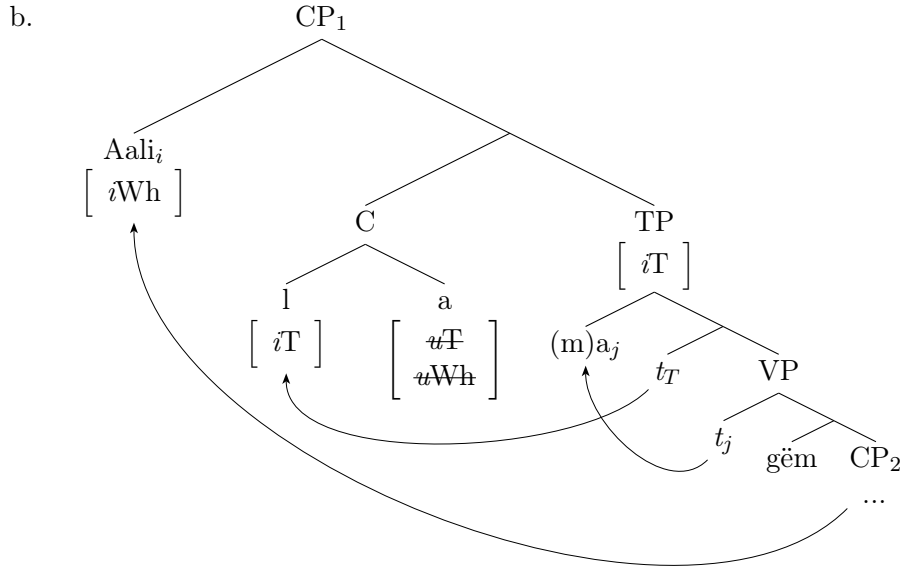
From the ungrammaticality of (68), the following appears to be true of the *(l)a* in Wolof: (i) the phrase carrying the *Wh*-feature must occupy the specifier of *a*, and (ii) *a* has only one specifier position. In other words, if the subject moved to Spec,CP in order to delete *uT*, *uWh* would remain unchecked because no other phrase could move to Spec,CP.

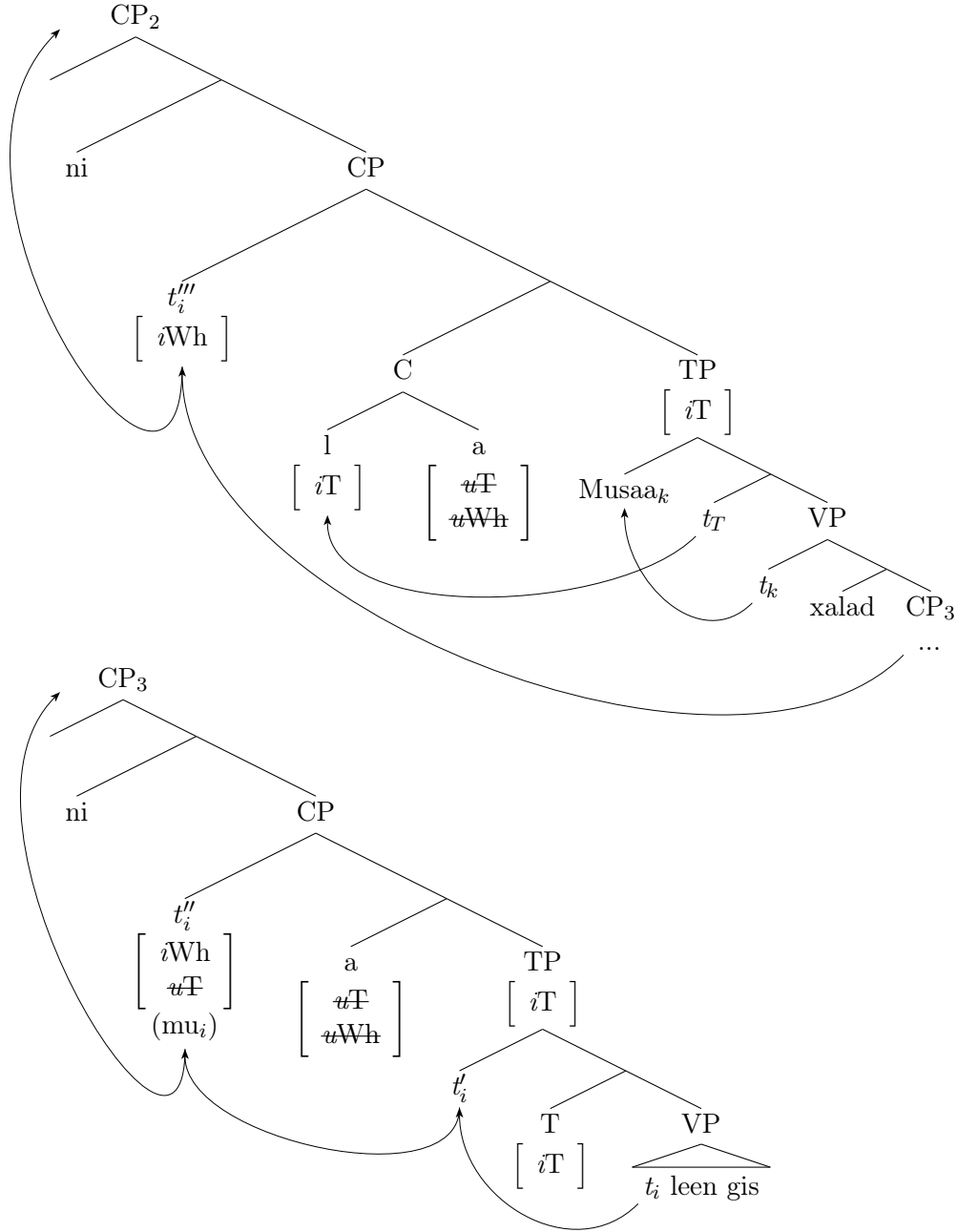
Let us now turn to long distance movement. It was shown in 5.1 that A'-extraction in Wolof is possible only out of clauses headed by *(l)a*. Furthermore, *(l)a* must also occupy every C between the extraction site and the final landing site of the moved element.

- (69) Long distance extraction in Wolof  
Téère **l-a**-ñu gëm ni **l-a**-a jox Musaa.  
book *l*-C<sub>WH</sub>-3PL believe that *l*-C<sub>WH</sub>-1SG give Musa  
*“They believe that I gave [A BOOK]<sub>FOC</sub> to Musa.”*

The occurrence of *(l)a* in C of embedded clauses is straightforwardly explained by assuming that the extracted element passes through the Spec,CP of each embedded clause. If *(l)a* is the spell-out of a complementizer that carries a Wh-feature, its presence in C of every embedded clause is necessary for the A'-moved element to be fronted to the beginning of the sentence. The example in (70) illustrates the extraction of an embedded focused subject.

- (70) Long-distance subject extraction  
a. Aali **l-a**-a gëm ni **l-a** Musaa xalad ni mu-**a** leen gis.  
Ali *l*-C<sub>WH</sub>-1SG believe that *l*-C<sub>WH</sub> Musa think that 3SG.SBJ-C<sub>WH</sub> 3PL.OBJ see  
*“I believe that Musa thinks that [ALI]<sub>FOC</sub> saw them.”*





In (70b), the subject first moves from inside the VP to Spec,TP, to check  $u\phi$  on T. At the same time, the uninterpretable T feature on the subject is checked and marked for deletion via Agree with T. However, it is not immediately deleted and remains available for further operations within the same cycle. Next, the subject moves from Spec,TP to Spec,CP in order to check both  $uT$  and  $uWh$  on C.  $uT$  on the subject now has to be deleted, since the phase has ended. The C of the next higher clause needs to delete its  $uT$  and  $uWh$ . The closest constituent that it can attract to delete its  $uT$  is TP, resulting in T-to-C, which surfaces as *l* preceding *a*. The phrase that carries

*iWh* is the extracted subject located in the lower Spec,CP, which is now attracted to the higher Spec,CP. This analysis explains why *l-* occurs in every C, except the one where the local subject is extracted, and accounts for the locality of the subject/non-subject asymmetry – it is only there that the subject can delete the uninterpretable T feature on C.

In addition to *(l)a*, a subordinating complementizer *ni* occurs in every embedded clause in cases of long-distance extraction in (69) and (70). The complementizer *ni* also occurs in both non-extraction and extraction constructions, as in (71).

(71) Subordinating complementizer *ni* in Wolof

- a. Gëm na-nũ      **ni**    Aali gis      na-Ø      Musaa  
believe C<sub>AFF</sub>-3PL that Ali see-3SG C<sub>AFF</sub>-3SG Musa  
*“They believe that Ali saw Musa.”*
- b. K-an l-a-nũ      gëm    **ni**    l-a      Aali gis?  
CM-Q *l*-C<sub>WH</sub>-3PL believe that *l*-C<sub>WH</sub> Ali see  
*“Who do they believe that Ali saw?”*

The proposed analysis assumes that, if *(l)a* and CM-*u* are treated as complementizers, we have to allow for multiple CP layers in Wolof. In this sense, Wolof would be similar to Korean, which distinguishes between mood markers, 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 (MOOD), and one that indicates subordination (SUBORDINATORS) – which some languages would conflate, and some keep separate. Wolof would belong to the second category, distinguishing sentential particles that mark modality, and a subordinating particle. Another possible analysis is to assume a Split CP along the lines of Rizzi (1997), where *ni* would be a high complementizer (Force), and *(l)a* a low complementizer (Fin).

Another thing to notice is the occurrence of a subject pronoun *mu* in lieu of the extracted subject in the most embedded clause in (70). I assume that this has to do with the phonological status of *a*, which is a clitic and thus cannot stand on its own. This is supported by the fact that *a* always forms a phonological unit with the element in its specifier, causing phonological changes in the form of vowel coalescence if that element happens to end in a vowel, as discussed in §2. In long distance extraction, a trace occupies the specifier of the most embedded *a*. In order to provide it with a host, a subject pronoun is pronounced in the position of the trace.

In this section I have offered an analysis of the subject/non-subject asymmetry in Wolof *a*-constructions by analyzing it as a T-to-C asymmetry along the lines of Pesetsky and Torrego 2001. I argue that *l*-, which precedes *(l)a* in all instances, except at the local subject extraction site, is T that has moved to C in order to delete the uninterpretable T feature on C. T-to-C does not occur in local subject extraction due to nominative case being *uT* on D, and as such capable of deleting *uT* on C by moving to its specifier. Since in those cases the subject also deletes *uWh* on C, T-to-C movement is unnecessary, and baned by the Economy Condition. In case of extraction of any other element, T-to-C movement must take place, because the extracted phrase does not bear nominative case (i.e. *uT*), or is not close enough to be attracted by the complementizer.

We have now investigated agreement patterns of C, exhibited by its two allomorphs, CM-*u* and *(l)a*. In §4 and §5 we saw that CM-*u* and *(l)a* occur in various structures. Table 1 summarizes their distribution in the variety of Wolof discussed in this paper.

		(l)a	CM-u
HIGHEST C	questions	✓	✓
	focus	✓	*
	comparatives	✓	*
	relative clauses	*	✓
INTERMEDIATE C		✓	*

Table 1: The distribution of complementizers CM-*u* and *a* in Wolof.

The parallel between focus constructions and questions/comparatives is not surprising. It has been observed that languages which have a designated focus position tend to move their *wh*-phrases to that position as well (Horvath, 1986), and comparatives are also claimed to involve focusing (Reglero, 2006; Merchant, 2009).<sup>24</sup> In that view, the occurrence of movement which resembles focus movement in languages such as Hungarian (Horvath 1986; É. Kiss 1998) in these structures is not unexpected. If this were the complete list of environments in which CM-*u* and *(l)a* occurred, it would be reasonable to assume that *(l)a*, in addition to having a Wh-feature, also has a focus feature associated with it, triggering A'-movement of the focused constituent to its specifier, and that CM-*u* is the *elsewhere* A'-movement complementizer. However, the obligatory occurrence of *(l)a* in every intermediate C between the extraction and the final landing site makes it difficult to argue that every C along the path of A'-movement has a focus feature, or, for that matter, that the only

<sup>24</sup>See Baglini (to appear) for an analysis of Wolof comparatives.

way to A'-extract a constituent out of any clause-type is to cleft it.<sup>25</sup> We are therefore left with two puzzles to solve. First, why do the subject/non-subject asymmetry and agreement in  $\varphi$ -features not surface simultaneously? Second, what determines their distribution in different constructions, i.e. why can C in questions surface as either of the complementizers, in relative clauses only as CM-*u*, and in focus constructions, comparatives, and all embedded C positions only as *(l)a*? I propose an answer to these questions in the following section.

## 6 A'-Complementizer Allomorphy

In §4 and §5 we investigated the similarities in behavior and syntactic properties between CM-*u* and *(l)a*: they occur in A'-movement constructions, they occupy a position immediately dominating the TP, and they cannot co-occur with any other sentence particle, including each other. Furthermore, there is no clear difference in meaning in the environment in which they can both occur – matrix *wh*-questions. All these properties are consistent with the view that CM-*u* and *(l)a* are allomorphes of the same complementizer,  $C_{WH}$ . I propose that  $C_{WH}$  in Wolof has the feature specification in (72). The C head needs to establish agreement both in  $\varphi$ -features, and with T, to check its uninterpretable  $\varphi$ - and T-features. Furthermore, it has an EPP feature, which requires the phrase with the *Wh*-feature to move to Spec,CP.

$$(72) \quad \frac{\text{The feature specification of } C_{WH}}{\begin{array}{c} C_{WH} \\ \left[ \begin{array}{c} uWh \\ u\varphi \\ uT \\ EPP \end{array} \right] \end{array}}$$

The two allomorphs of  $C_{WH}$  do not each exhibit all agreement features: CM-*u* shows Wh- and  $\varphi$ -agreement, and *(l)a* Wh- and T-agreement. If the difference between constructions with CM-*u* and those with *(l)a* is not structural, and does not seem to correlate with a particular feature specification, and if they both encode A'-movement, then the first task of any analysis is to offer a satisfactory explanation of their distribution. I argue for a post-syntactic account and claim that the surface form of  $C_{WH}$  depends on the presence or absence of the  $\varphi$ -feature (i.e. the class marker) in C, which in turn depends on the presence or absence of the  $\varphi$ -feature in Spec,CP. The data show

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<sup>25</sup>But see Torrence (2013) on a proposal for successive-cyclic clefting in Wolof.

that the  $\varphi$ -feature is overt in only one position in the CP-layer: either in the C head, or in its specifier. If it is overt in C, the complementizer surfaces as *CM-u*, and if it is overt in Spec,CP, the complementizer surfaces as *(l)a*. Similarly, the T-feature in C is only overt when it is adjacent to C, and this occurs if the  $\varphi$ -feature is not overt in C. I argue that the presence or absence of the  $\varphi$ -feature is governed by two constraints: the Obligatory Contour Principle, which prohibits adjacent identical features, and Recoverability, which prohibits the deletion of unrecoverable material. This section is dedicated to exploring the details of this analysis.

### 6.1 $\text{OCP}_\varphi$

The  $\varphi$ -feature in the CP layer always surfaces overtly only in one place: either in the specifier, or on the complementizer. I pursue the idea that this observation is the key to understanding the distribution of *CM-u* and *(l)a* and propose that there is a morphological Obligatory Contour Principle (OCP) constraint in Wolof which prohibits identical  $\varphi$ -features to surface in a specifier-head configuration, as in (73).

(73) Morphological Obligatory Contour Principle constraint in Wolof

$$\begin{array}{c}
 * \\
 \text{XP} \\
 \swarrow \quad \searrow \\
 \text{Y} \quad \text{X}' \\
 [\varphi] \quad \swarrow \\
 \quad \text{X} \\
 \quad [\varphi]
 \end{array}$$

The repair to the OCP violation is to delete the  $\varphi$ -feature node in C, or to delete the entire phrase in Spec,CP. I furthermore propose that  $\varphi$  in C is realized as a separate node in the post-syntax, as *CM-u* is bi-morphemic. In subject extraction, *uT* is valued via subject movement to Spec,CP, but in non-subject extraction, which leads to T-to-C movement (see §5), T is adjoined to C above  $\varphi$ . The structure of C in subject and non-subject extraction is represented in (74) and (75), respectively.

(74) C in subject extraction

$$\begin{array}{c}
 \text{C} \\
 \swarrow \quad \searrow \\
 \left[ \begin{array}{c} u\varphi \end{array} \right] \quad \text{C} \\
 \quad \left[ \begin{array}{c} uWh \\ uT \end{array} \right]
 \end{array}$$

(75) C in non-subject extraction

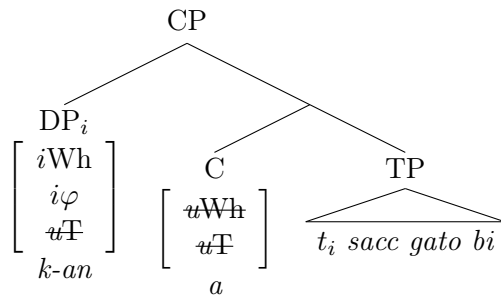
$$\begin{array}{c}
 \text{C} \\
 \swarrow \quad \searrow \quad \searrow \\
 \text{T} \quad \left[ \begin{array}{c} u\varphi \end{array} \right] \quad \text{C} \\
 \quad \quad \left[ \begin{array}{c} uWh \\ uT \end{array} \right]
 \end{array}$$



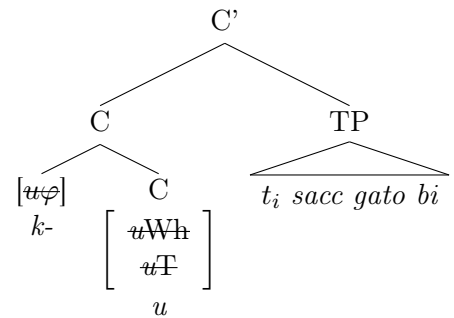


that case  $\varphi$  in C is present and conditions allomorphy: the complementizer is realized as  $u$ , shown in (79b). In this situation, T is not overt, as per the Vocabulary Insertion rules in (76), it only surfaces as  $l$  if it is adjacent to C. The examples illustrate subject extraction, when  $uT$  is valued by the subject phrase itself, as explained in §5.

(79) a. Subject a-question



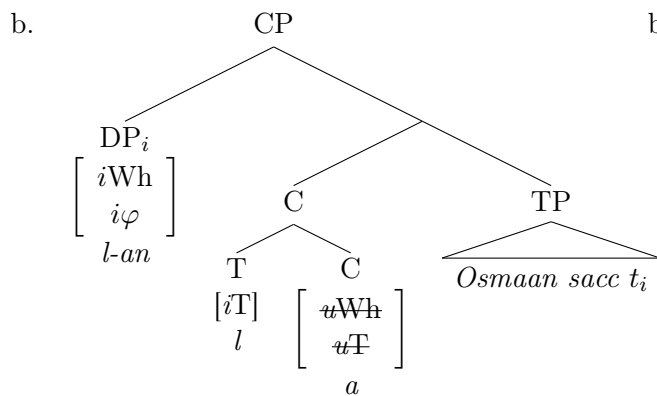
b. Subject u-question



When a non-subject moves to Spec,CP,  $uT$  is valued by T-to-C movement, in which case T adjoins to C and is realized as  $l$ . I consider this to be the result of universal adjacency conditions on contextual allomorphy (Embick 2010):  $l$  is a contextual realization of T, triggered by its adjacency to C.

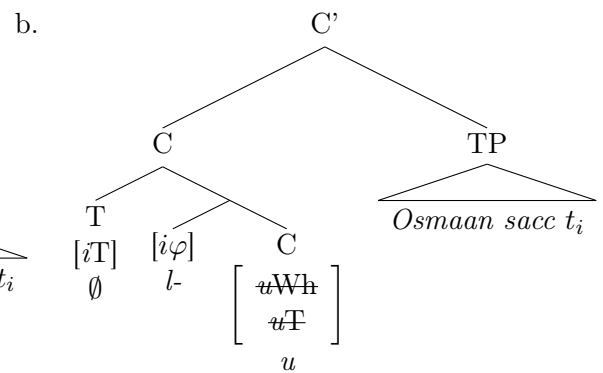
(80) Non-subject a-question

- a. L-an l-a Osmaan sacc?  
CM-Q  $l-C_{WH}$  Osman steal  
“What did Osman steal?”



(81) Non-subject u-question

- a. L-u Osmaan sacc?  
CM- $C_{WH}$  Osman steal  
“What did Osman steal?”



Under the analysis developed here, we do not need to make the unmotivated stipulation that the complementizer CM- $u$  selects for an empty operator, and that the empty operator only occupies the specifier of CM- $u$ . A post-syntactic analysis offers a natural explanation for the occurrence of the

$\varphi$ -feature only in one position in the CP-layer, attributing it to an Impoverishment rule with the purpose of avoiding a marked structure banned by a morphological OCP $_{\varphi}$ . OCP $_{\varphi}$  was first proposed in phonology (Leben 1973; Goldsmith 1976) as a constraint that prohibits adjacent identical elements at the melodic level. It was initially an analysis for tonal dissimilation in African tone languages, but was later extended to account for all kinds of dissimilation phenomena concerning adjacent segments or features on the same (autosegmental) tier (e.g. McCarthy 1986). Similar phenomena (referred to as morphological dissimilations, haplogogies, repetition avoidance, morphological OCP, etc.) have been identified to occur in the mapping between syntax and phonology, prohibiting adjacent identity (in form and/or content of morphemes) in particular morphosyntactic configurations. In an overview chapter, Nevins (2012) identifies different levels at which an OCP-style constraint may apply, and various repair mechanisms that languages employ to avoid the offending structure. For example, Nevins (2007) analyzes the spurious *se* in Spanish as the result of dissimilation of adjacent clitics both bearing the feature [-Participant]. Ackema and Neeleman (2004) (also Benmamoun and Lorimor (2006)) argue that the post-syntactic allomorphy rules that adjust the feature content of terminals can be sensitive to initial prosodic phrasing (which they assume occurs before the application of context-sensitive allomorphy rules), and delete identical features of terminal nodes contained within the same prosodic domain. They explore these effects in subject-verb agreement, and give examples from languages such as Dutch and Arabic, where in configurations that result in VS order, when the subject pronoun and the verb are found within the same prosodic phrase, the agreement on the verb is *weakened*: in Dutch the verb does not agree with the second person subject and exhibits first person agreement, which is explained as the dissimilation in the feature addressee [Add], and in Arabic the agreement is in person and gender, but not in number. Crucially, both these accounts rely on some type of structural adjacency. Similarly, in Wolof an OCP-like markedness constraint prohibits  $\varphi$ -features in adjacent nodes (in a Specifier-Head configuration), as in (73).

We now have an account of the two versions of *wh*-questions, which are the only A'-movement construction which can occur with either of the A'-complementizer allomorphs, CM-*u* and (*l*)*a*. In all other constructions, only one of the allomorphs is allowed. In the following sections, I offer an account of the distribution of CM-*u* and (*l*)*a* in other constructions.

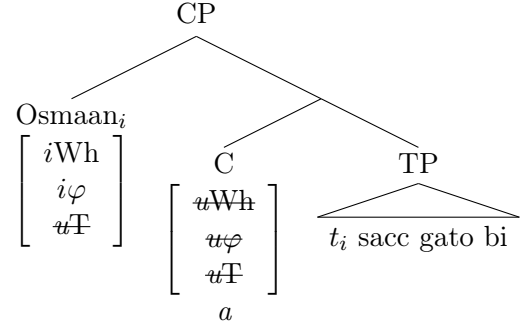
## 6.2 Recoverability

The only option of avoiding an  $\text{OCP}_\varphi$  violation in focus constructions and comparatives is to delete the  $\varphi$ -feature in C, causing those structures to always surface with  $(l)a$ , as in extraction of a focused subject illustrated in (82), and of a focused non-subject in (83).

(82) Subject focus

- a. Osmaan<sub>i</sub> a  $t_i$  sacc gato bi.  
 Osman<sub>i</sub> C<sub>WH</sub>  $t_i$  steal cake DEF  
 “[OSMAN]<sub>FOC</sub> stole the cake.”

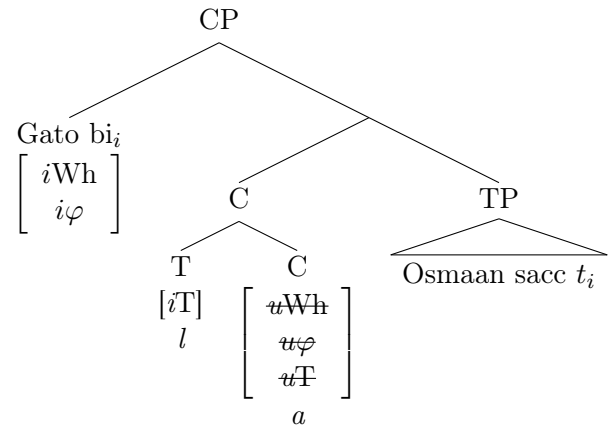
b.



(83) Non-subject focus

- a. Gato bi l-a Osmaan sacc.  
 cake DEF l-C<sub>WH</sub> Osman steal  
 “Osman stole the [CAKE]<sub>FOC</sub>”

b.



I argue that the obligatoriness of  $(l)a$  in all constructions in which Spec,CP is occupied by a lexical DP that is not a *wh*-phrase is due to an important constraint on deletion – Recoverability. Namely, a node can only be deleted if there is no unrecoverable material that gets deleted along with it. A similar constraint is proposed by Pesetsky (1998), in an OT-approach to the pronunciation of complementizers. In Ackema and Neeleman (2004), the suppression (i.e. deletion, impoverishment) of a morphosyntactic feature is also subject to a notion of recoverability: the target of the rule and the terminal mentioned in the rule’s context must agree. The notion of recoverability under agreement is particularly applicable to the case under discussion: the  $\varphi$ -feature is deleted from one of the nodes in an agreement configuration. Focus structures and comparatives can only contain the allomorph  $(l)a$  because the DPs in their Spec,CP contain irretrievable material and can therefore

not be deleted, whereas the featural content of the *wh*-operator can easily be retrieved from  $C_{WH}$ , which contains all of the same features.

Recoverability also explains why complex *wh*-phrases can occur only in the specifier of  $(l)a$ , as in (84).

- Complex *wh*-questions can only contain  $(l)a$
- (84)    a.    B-an   xale   l-a   Faatu gis?  
                  CM-Q child l-C Fatou see  
                  “Which child did Fatou see?”
- b.    \*B-an   xale   b-u   Faatu gis?  
                  CM-Q child CM-C Fatou see

The obliteration of the phrase in Spec,CP is blocked, because it contains irretrievable material: the noun phrase. The deletion of the specifier node would result in the deletion of the entire DP, as in (85).

- (85)    Obliteration of Spec,CP with a complex *wh*-phrase  
                  \*B-u            Faatu gis?  
                  CM- $C_{WH}$  Fatou see  
                  intended: “Which child did Fatou see?”

In an analysis which assumes that CM-*u* selects for an empty operator, and vice versa, it does not straightforwardly follow why other phonologically overt material is also banned from Spec,CP. I argue this to be the case because the Impoverishment rule targets the whole phrase in Spec,CP containing the offending feature.

Recall the distribution of CM-*u* and  $(l)a$  in A'-movement constructions in Wolof, repeated here in Table 2.

		(l)a	CM-u
HIGHEST C	questions	✓	✓
	focus	✓	*
	comparatives	✓	*
	relative clauses	*	✓
INTERMEDIATE C		✓	*

Table 2: The distribution of complementizers CM-*u* and  $(l)a$  in Wolof.

I have offered an analysis for the occurrence of both allomorphs in *wh*-questions, and the obligatoriness of  $(l)a$  in focus constructions and comparatives. We are now left with two more cases to account for. First, relative clauses are only possible with the complementizer CM-*u*, meaning that we have to explain why the relative operator, which should contain all retrievable material, must

obligatorily be deleted in relative clauses; in other words, why relative CPs do not behave like interrogative CPs. The situation in long distance extraction is quite the opposite: since only the complementizer  $(l)a$  can occur in intermediate C positions, it is  $\varphi$  in C that must delete. This is also unexpected, because the feature content of a copy/trace is not expected to differ from that of the extracted phrase. Intermediate positions should thus behave just as final landing positions with respect to  $OCP_{\varphi}$  and Recoverability. I start with the latter case.

### 6.3 Intermediate traces

In long-distance extraction in Wolof,  $(l)a$  obligatorily occupies all intermediate C positions. In the variety of Wolof discussed in this paper, this is the only option, meaning that the  $OCP_{\varphi}$  violation in non-final CP-layer can only be avoided by deleting the  $\varphi$ -feature in C, regardless of the nature of the element in Spec,CP. I argue that this is the result of the timing of the Spell-Out, which in those dialects precedes movement. In successive-cyclic movement the derivation in which the phrase from Spec,CP is deleted crashes, because there is nothing left to be attracted by the higher C.

It is fairly standard to assume that Spell-Out happens cyclically, as a result of the merger of particular heads (*phase heads*), that trigger Spell-Out of its complement (a *phase*) (Chomsky 2000). The notion of phases is particularly relevant in considerations of long-distance movement, as it is mostly assumed that such movement can only happen through specific positions on the edges of phases, which results in cyclicity effects in long-distance extraction. We have seen that Wolof is one of the languages that provides evidence for such movement, since it requires the  $A'$ -movement complementizer to occupy every intermediate C position along the path of extraction. Since the analysis of complementizer allomorphy proposed here is a post-syntactic one, meaning that the described processes take place during Spell-Out, we need to consider the predictions it makes for long-distance movement.

In much of the literature on long-distance extraction, it is assumed that a phase is impenetrable to further movement (Chomsky 2000). I follow Fox and Pesetsky (2005) and propose that movement can happen either before or after Spell-Out, provided that the linear order within a phase established during Spell-Out is preserved after movement. Let us examine the predictions of this proposal. For the present purposes, it is sufficient to restrict the discussion to the CP phase. Consider the sentence in (86).

- (86) Long-distance object extraction in Wolof  

$$\begin{array}{l} [_{CP2} \text{ K-an}_i \text{ l-a} \quad \text{Isaa wax ne} \quad [_{CP1} t_i \text{ l-a} \quad \text{xaj bi} \quad \text{matt } t_i ] ]? \\ [_{CP2} \text{ CM-Q } l\text{-C}_{WH} \text{ Isaa say that } [_{CP1} t_i l\text{-C}_{WH} \text{ dog DEF bite } t_i ] ] \\ \text{“Who did Isaa say that the dog bit?”} \end{array}$$

I first consider the option in which movement follows Spell-Out. We start at the moment when the Spell-Out of the embedded CP (CP1) is triggered, and the  $\text{OCP}_\varphi$  evaluates the resulting construction. This proceeds in the way explained above: either  $\varphi$  in C or the whole Spec,CP node can delete, resulting in the complementizer surfacing as either  $(l)a$  or CM- $u$ , respectively:

- (87) Deletion of  $\varphi$  in C  

$$\begin{array}{l} [_{CP1} \text{ k-an}_i \text{ l-a} \quad \text{xaj bi} \quad \text{matt } t_i ] \\ [_{CP1} \text{ CM-Q } l\text{-C}_{WH} \text{ dog DEF bite } t_i ] \\ \text{“who did the dog bite?”} \end{array}$$

- (88) Deletion of Spec,CP  

$$\begin{array}{l} [_{CP1} \emptyset \text{ k-u} \quad \text{xaj bi} \quad \text{matt } t_i ] \\ [_{CP1} \emptyset \text{ CM-C}_{WH} \text{ dog DEF bite } t_i ] \\ \text{“who did the dog bite?”} \end{array}$$

If another CP phase (CP2) with a *wh*-complementizer is built, it needs a *wh*-phrase to move to its specifier. If Obliteration deleted  $\varphi$  in C of CP1, as in (87), the operator from Spec,CP is present and can move to Spec,CP of CP2, as in (89). The same option of deleting the operator or  $\varphi$  in C then happens in CP1. I present only the example in which  $\varphi$  in C is deleted and the highest complementizer surfaces as  $(l)a$ :

- (89) Successive cyclic movement precedes Spell-out  

$$\begin{array}{l} [_{CP2} \text{ K-an}_i \text{ l-a} \quad \text{Isaa wax ne} \quad [_{CP1} t_i \text{ l-a} \quad \text{xaj bi} \quad \text{matt } t_i ] ]? \\ [_{CP2} \text{ CM-Q } l\text{-C}_{WH} \text{ Isaa say that } [_{CP1} t_i l\text{-C}_{WH} \text{ dog DEF bite } t_i ] ] \\ \text{“Who did Isaa say that the dog bit?”} \end{array}$$

If, however, the phrase in Spec,CP of CP1 is deleted as a result of  $\text{OCP}_\varphi$  repair, as in (88), there is no *wh*-phrase left in the specifier of CP1 to move to Spec,CP of CP2 in a dialect in which Spell-Out precedes movement. This derivation therefore crashes, and the derivation in which  $\varphi$  in C is deleted is the only one that converges, meaning that, if movement happens after Spell-Out,  $(l)a$  is the only exponent that can surface in intermediate positions.

Let us now investigate the second option, in which movement occurs before Spell-Out. In that case, in the moment of Spell-Out of CP1, Spec,CP contains the copy of the *wh*-phrase which has all

of the same features as the phrase which is moved into the higher Spec,CP. Again, deletion of  $\varphi$  in C or the phrase in Spec,CP is governed by Recoverability, meaning that only a *wh*-operator could be deleted, and never a full DP. Unlike in the case in which movement occurs after Spell-Out, in this case the phrase from Spec,CP is already located in the higher Spec,CP, so deleting its copy does not cause the derivation to crash. When movement precedes Spell-Out, intermediate C's behave just like matrix C's. The prediction is that in the dialects in which movement occurs before Spell-Out either *(l)a*, as in (89), or CM-*u*, as in (90), can surface in the intermediate position. However, if CM-*u* can occupy intermediate positions, this should only occur in *wh*-questions, and never in focus constructions, due to Recoverability.

- (90) *Successive cyclic movement follows Spell-Out*  

$$\begin{array}{l} \overline{[_{CP2} \text{ K-an}_i \text{ l-a} \quad \text{Isaa wax ne} \quad [_{CP1} \emptyset \text{ k-u} \quad \text{xaj bi} \quad \text{matt } t_i ] ]?} \\ [_{CP2} \text{ CM-Q } l\text{-C}_{WH} \text{ Isaa say that } [_{CP1} \emptyset \text{ CM-C}_{WH} \text{ dog DEF bite } t_i ] ] \\ \text{“Who did Isaa say that the dog bit?”} \end{array}$$

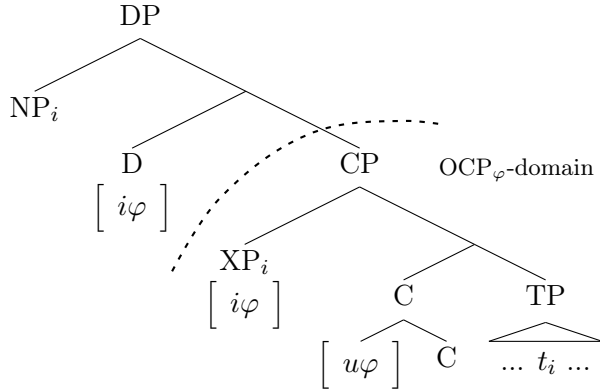
These predictions are confirmed by the data. In the variety of Wolof discussed in this paper, only *(l)a* can occupy intermediate positions of movement, meaning that in that dialect, Spell-Out precedes movement. Torrence (2005, 2012a,b) shows data in which CM-*u* is allowed in intermediate positions, alongside *(l)a* (see footnote 21), and, as expected if this analysis is on the right tract, he only reports such an option for *wh*-questions, never focus constructions. In those dialects, movement precedes Spell-Out. Crucially, there are no reported dialects in which only CM-*u* occurs in intermediate C positions, and indeed, my analysis predicts that such dialect should not exist.

#### 6.4 Relative clauses

Finally, let us examine the predictions of the analysis for C in relative clauses. It is proposed that relative clauses in Wolof have the structure in (91). Since Spell-Out occurs in a cyclic fashion, I propose that the domain of the  $\text{OCP}_{\varphi}$  is the CP phase, meaning that the  $\varphi$ -feature in D is not taken into consideration in evaluating markedness.



(91) Wolof relative clause and the domain of  $OCP_\varphi$



The analysis developed thus far then predicts that the complementizer allomorphy in relative clauses should parallel that in matrix questions: the complementizer should surface as either CM-*u* or *(l)a*, depending on which the operator should be either absent or overt. This is, however, not what we observe: in relative clauses, only the allomorph CM-*u* is possible, and the operator is never overt.

Relative CPs, however, are not quite identical to interrogative CPs, and where they differ is in the featural content of C. Recall from the discussion in §4 that the  $\varphi$ -feature complex in relative clauses consists of the class feature, the definiteness feature, and the proximity feature. All these features are also contained on the relative operator.<sup>27</sup> In questions, the complementizer allomorph CM-*u* has only one variant – the one with the vowel -*u*. In relative clauses, on the other hand, CM-*u* has in fact three variants: CM-*u*, CM-*i*, CM-*a*. As it was shown in §4, the form of the complementizer encodes definiteness and proximity of the head noun. The relevant examples are repeated in (92).

(92) The relative complementizer encodes definiteness and proximity

- a. (\*a-b)      xaj **b-u**      ma bëgg  
(INDEF-CM) dog CM-C<sub>WH</sub> 1SG like  
“a dog that I like”
- b. xaj (\*b-i)      **b-i**      ma bëgg  
dog (CM-DEF.PROX) CM-C<sub>WH</sub> 1SG like  
“the dog (here) that I like”
- c. xaj (\*b-a)      **b-a**      ma bëgg-oon  
dog (CM-DEF.DIST) CM-C<sub>WH</sub> 1SG like-PST  
“the dog (there) that I liked”

<sup>27</sup>As a result of whatever mechanism ensures co-indexing between the head noun and the relative operator.

I therefore propose that C in relative clauses carries the definiteness feature, which it obtains in the process of  $\varphi$ -agreement. The definiteness feature is only expressed with the complementizer CM-*u*, which can be realized with three different exponents corresponding to indefinite, definite proximal, and definite distal features. The Vocabulary Insertion rules therefore need to be made more precise:<sup>28</sup>

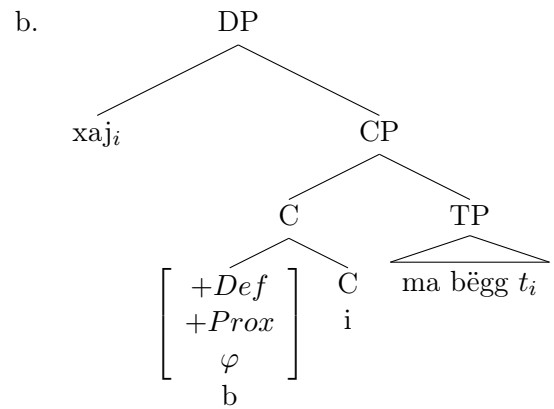
(93) Vocabulary insertion rules, second version

- a. C[+Wh]  $\rightarrow u/\varphi, -Def$ \_\_
- b. C[+Wh]  $\rightarrow i/\varphi, +Def, +Prox$ \_\_
- c. C[+Wh]  $\rightarrow a/\varphi, +Def, -Prox$ \_\_
- d. C[+Wh]  $\rightarrow a$
- e. T  $\rightarrow l$ /\_\_C

I argue that the reason for the obligatory deletion of the relative operator in Spec,CP lies in the fact that the feature complex in C of relative clauses does not only contain the  $\varphi$ -feature, but also definiteness and proximity. Recoverability therefore prevents the deletion of irretrievable material, protecting the deletion of  $\varphi$  in C. The only option, then, is to delete the operator in Spec,CP, which causes the  $\varphi$ -feature in C to be pronounced and the complementizer to surface as *-u*, *-i*, or *-a*, per the Vocabulary Insertion rules in (93).

Obligatory deletion of Spec,CP in relative clauses

- (94) a. xaj b-i          ma bëgg  
          dog CM-C<sub>WH</sub> 1SG like  
          “the dog that I like”



<sup>28</sup>Technically, the Vocabulary Insertion rule in (93c) is not necessary, since the exponent for the definite distal complementizer is homophonous with the exponent for the elsewhere condition in (93d). I posit two rules to make the distinction between the two complementizer forms clearer.

In this section I argued for a post-syntactic analysis of the A'-complementizer distribution in Wolof, attributing the difference between complementizer form in different A'-movement constructions to the interplay of a morphological OCP $_{\varphi}$  constraint, which prohibits adjacent identical  $\varphi$ -features, and a Recoverability condition on deletion, which prevents the deletion of nodes that carry irretrievable featural content. This analysis allows us to maintain a uniform account of A'-movement and two extraction effects that occur in Wolof: complementizer agreement and a subject/non-subject asymmetry.

## 7 Conclusion

This paper has been concerned with A'-extraction effects in Wolof and what they can tell us about well known properties of A'-movement – cyclicity and locality. Using Wolof as a case study, the analysis developed here aims to show that agreement lies at the center of all A'-extraction effects, and that their surface morpho-syntactic properties, such as complementizer alternations and subject/non-subject asymmetries, can at least partly be understood as resulting from the general mechanisms underlying the operation Agree.

All of the reviewed A'-extraction effects can be divided into two categories. One group consists of effects that occur long-distance, either at the top of the dependency, regardless of its remoteness from the original extraction site, or in a cyclic fashion. They are morphological reflexes of agreement between the phase head whose specifier the *wh*-phrase passes through and the *wh*-phrase. We therefore expect this type of agreement to reflect interpretable featural content of the *wh*-phrase – for example its  $\varphi$ -features and the Wh-feature – which is precisely what we find in languages such as Irish, Kinande, and Chamorro. As predicted, we find variation in the extent of agreement, depending on the uninterpretable features that the phase head needs to value, and also in the location of this type of agreement, depending on which phase head specifier(s) the extracted phrase passes through.

The other group of A'-movement effects are local, restricted to the clause in which the extracted phrase originated. Even though their morpho-syntactic profile is cross-linguistically quite varied, they always encode the same thing – the case of the extracted phrase, either by just distinguishing between the subject and all other phrases, as the English *that*-trace effect, or by encoding the case

of any extracted phrase, as Case-Agreement in Chamorro. This paper does not attempt to provide an analysis for all types of subject/non-subject asymmetries, nor does it claim that there exists one, unified account. It does, however, build on existing proposals that suggest that such effects are also best understood as agreement (Pesetsky and Torrego 2001; Henderson 2013), whose locality is the consequence of it not involving interpretable features of the *wh*-phrase, which are the only ones that can participate in agreement along the phrase’s movement path. These effects also vary in their location and featural content, but they are expected to involve the elements of the A’-marked CP-layer of the extraction clause.

This paper goes further in identifying the possible sources of variation in A’-extraction effects by investigating Wolof, which is an excellent candidate to study not just the morpho-syntactic realization of both long-distance and local A’-extraction effects, but also their interaction. Wolof is special in two ways: first, it encodes all effects on the same element, C, and second, the effects are never observed simultaneously and they are tied to different surface forms of C. The novelty of the approach advocated in this paper is in maintaining a unified syntax for the two types of A’-movement effects, and providing a realizational analysis in the framework of Distributed Morphology, which attributes the surface differences in the CP layer in Wolof to post-syntactic conditions on feature co-occurrence, shown to exist in many languages.

My analysis of Wolof gives support to a unified treatment of A’-extraction effects as agreement phenomena, and shows us that the theory of A’-movement needs to be informed by languages which exhibit complex morphological reflexes of various extraction effects.

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