

Wolof *Wh*-Movement at the Syntax-Morphology Interface

[Currently under review. Comments greatly appreciated.]

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1 Introduction

In the last several decades, with the rise of Distributed Morphology, the boundary between syntax and morphology is treated as much more permeable than by lexicalist approaches to word formation. In a theory of the syntax-morphology interface in which the post-syntactic component of the grammar is a separate module, with its own principles and constraints, the phonological reflection of syntactic structure is complicated and the expected output of syntactic derivations can be obscured, creating the appearance of syntactic distinctions where there in fact are none. This is due to various operations occurring in the post-syntactic component, which affect the output of syntax by deleting features, or even entire terminal nodes, by allowing a single node to be realized in more than one morphological position, or by collapsing multiple nodes into one. The operations of the post-syntactic component are no less constrained than those of the syntactic component; it is the interaction of the two that creates the appearance of disorder. This view is defended at length by Arregi and Nevins (2012), who attribute morphological processes to universal or language-specific markedness constraints in the post-syntax. This paper investigates the interaction of the syntactic and post-syntactic component in A'-movement in the Niger-Congo language Wolof and further argues in favor of such an approach.

A'-movement in Wolof exhibits several morphosyntactic effects. Similarly to *aL* in Irish (McCloskey 2000, 2001, 2002), C_{WH} in Wolof marks each intermediate C position between the extraction site and the final landing site. It also exhibits a subject/non-subject asymmetry, a type of the English *that*-trace effect (Perlmutter 1971), where the form of C_{WH} differs in case of subject extraction, as opposed to non-subject extraction. And lastly, its A'-movement complementizer reflects agreement in ϕ -features with the *wh*-operator in its specifier. What makes A'-extraction in Wolof especially interesting, and highly relevant for the discussion of the syntax-morphology interface, are the following two facts. First, all A'-extraction effects in Wolof surface on C, but with two different versions of the complementizer, *(l)a* and CM-*u*. *(L)a* exhibits a subject/non-subject asymmetry, as in (1)-(2), and it occurs in every C_{WH} on the path of A'-movement, shown in (3).¹

- | | |
|---|---|
| <p>(1) <u>Subject question with <i>(l)a</i>²</u> K-an a jox Musaa téere bi? CM-an C_{WH} hand Musa book DEF.SG “Who handed the book to Musa.”</p> | <p>(2) <u>Object question with <i>(l)a</i></u> K-an l-a Musaa gis? CM-an <i>l</i>-C_{WH} Musa see “Who did Musa see?”</p> |
| <p>(3) <u>Cyclicity in A'-movement in Wolof</u> K-an l-a-ñu gëm ni l-a Musaa xalad ni l-a Aali gis? CM-an <i>l</i>-C_{WH}-3PL believe that <i>l</i>-C_{WH} Musa think that C_{WH} Ali see “Who do they believe that Musa thinks that Ali saw?”</p> | |

CM-*u* does not exhibit the same effects as *(l)a*, but reflects agreement in ϕ -features with the covert *wh*-operator in its specifier:

¹Unless otherwise noted, all the data in this paper come from my own field work with native speakers of Wolof in Chicago, Paris, and Saint Louis, Senegal.

²Abbreviations: 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.

- (4) Subject question with CM-u
K-u jox Musaa tééré bi?
 CM-C_{WH} hand Musa book DEF.SG
 “Who handed the book to Musa.”
- (5) Object question with CM-u
Y-u Musaa gis?
 CM.PL-C_{WH} Musa see
 “What(pl) did Musa see?”

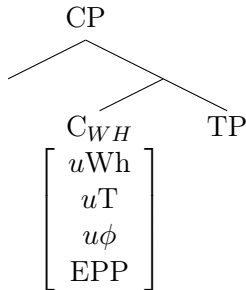
The second crucial observation is that A'-movement structures with two versions of the complementizer are for the most part in complementary distribution; they both occur in *wh*-questions, as in (1)-(2) and (4)-(5), but only one of the versions of the complementizer is allowed in all other A'-constructions. For example, relative clauses are only formed with CM-u, and exhaustive focus constructions only with (l)a:

- (6) Relative clause
 xaj **b-u** ma bëgg
 dog CM-C_{WH} 1SG like
 “a dog I like”
- (7) Exhaustive focus
 Musaa **l-a-a** gis.
 Musa l-C_{WH}-1SG see
 “I saw MUSA.”

The near-complementary distribution of the two versions of C gives the impression that different syntactic structures underlie the distinctions in their CP-layer. The goal of this paper is to show that all surface differences between the two seemingly different A'-movement constructions can be explained as simply that – surface differences, resulting from post-syntactic processes. Specifically, I argue that the A'-movement complementizer in Wolof has the same relevant featural content in all A'-movement constructions, meaning that all extraction effects—complementizer agreement in Wh- and ϕ -features and the subject/non-subject asymmetry—are present in the syntax of each of them.

In developing this argument, I make a specific claim about the origin of all A'-extraction effects in Wolof: I propose an analysis which treats them all as agreement between C and some element in the clause. This is an obvious analysis of the occurrence of the complementizer in all C positions between the extraction site and the final landing site (Agree between C and the extracted phrase in the Wh-feature) and of the occurrence of ϕ -features of the extracted phrase on C. The subject/non-subject asymmetry is a more controversial type of effect. I follow Pesetsky and Torrego (2001) in analyzing it as a T-to-C asymmetry, caused by an uninterpretable T-feature on C. I argue that all instances of A'-movement in Wolof are obligatorily accompanied by C_{WH}, which has the syntax and feature specification in (8).

- (8) Feature Specification of C in Wolof



Specifically, C_{WH} is an agreeing complementizer, with uninterpretable Wh-, T- and ϕ -features. The uninterpretable Wh- and ϕ -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 in this analysis both can value *uT*). The difference in surface forms of

C is the result of post-syntactic morphological rules, which realize C as *-u* when it is adjacent to the φ -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 φ (CM) in C.

If every C_{WH} has an uninterpretable φ -feature which must be valued via agreement, what causes it to sometimes be absent in the surface representation, as is the case with the allomorph *(l)a*? I propose that the presence of the φ -features in C depends on the presence of matching φ -features in Spec,CP. Crucially, if an overt marker of a φ -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> K-an l-a-ñu gis? CM-Q l-C_{WH}-1/3PL see <i>"Who did we/they see?"</i></p> | <p>(10) <u><i>Wh-question with CM-u</i></u> (*K-an) K-u ñu gis? (CM-Q) CM-C_{WH} 1/3PL see <i>"Who did we/they see?"</i></p> |
|---|--|

(9) and (10) show us 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 (Torrence 2005, 2012a,b). This is a general property of the two varieties of A'-constructions. I argue this to be a consequence of a morphological Obligatory Contour Principle constraint, which prohibits the φ -feature to occupy two adjacent nodes (here the head C and its specifier), and triggers a repair: one of the nodes containing the φ -feature is deleted. This can either be the φ -feature in C, or the phrase in Spec,CP. However, if either of the two contains content irretrievable in the CP-layer, its deletion is blocked, which results in a particular construction always surfacing with only one allomorph of C. Similarly, only the *(l)a* allomorph exhibits a subject/non-subject asymmetry, which I attribute to post-syntactic adjacency conditions on contextual allomorphy (Embick 2010): *l-* is analyzed as a contextual realization of T in C, triggered by its adjacency to C.

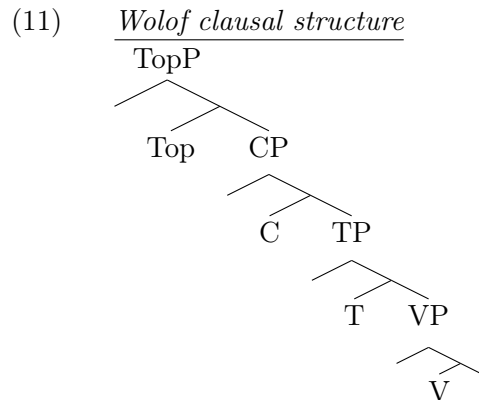
A'-movement effects in Wolof illustrate the tension between the principles of the syntactic and the post-syntactic component, and the morpho-syntactic consequences of their interaction, particularly well. The syntax of A'-extraction involves agreement, resulting in adjacent featural identity. OCP-type constraint is a typical post-syntactic phenomenon that militates against adjacent identity in particular morphosyntactic configurations, as identified in various languages (e.g. Nevins 2007, 2012; Ackema and Neeleman 2004). Such effects are known to be language specific, as are their repairs. The analysis I propose for Wolof A'-movement morphosyntax is therefore not meant to apply in similar configurations in all languages. OCP-effects are, however, expected to arise precisely in the type of rich agreement configurations as is the CP-layer in Wolof A'-movement. This paper offers not only a unified analysis of A'-extraction effects and maintains a unified syntax of A'-extraction in Wolof, but crucially offers a principled account for the distribution of different shapes of the CP-layer in different instances of A'-movement.

The paper is organized as follows. Section 2 lays out the relevant details of Wolof clause structure and §3 presents the syntax of A'-extraction and justifies a unified syntactic treatment of all A'-movement in Wolof. The syntactic and post-syntactic analysis of the morpho-syntax of A'-movement effects is laid out in §4 and §5, respectively. The central section for the post-syntactic analysis of the differences in the CP-layers of the two construction types is §5; however, it rests on the syntactic analysis proposed in §3 and §4. The paper is concluded in §6.

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 presence or absence of A'-movement of the subject, 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).



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_{AFF}-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_{WH} child DEF.PL give Musa
 “The children gave the BOOK_{FOC} 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 (glossed as C_{AFF}), and *la* in the object focus sentence (glossed as C_{WH}). Second, the *subject marker* follows the particle *na* in (12) (*ñu*, 3PL), but is absent in (13).³ I discuss the properties of complementizers and subject markers in the remainder of this section.

Sentence particles are complementizer-like elements, whose presence is obligatory in order for the sentence to receive temporal interpretation; sentences which lack particles also lack overt tense

³Another difference is the position of the verb. This is not relevant for the present purposes.

morphology, and their temporal interpretation depends on context (Njie 1982).⁴ There are a number of different particles: A'-extraction particle (traditionally considered subject/complement focus), imperative, affirmative, obligative and negative imperative/obligative particles, and four different temporal modality particles, which express reference to a past event, near or remote in time, or reference to a hypothetical or expected future event. Sentence particles are located in a projection which takes the TP as its complement, and are in complementary distribution. Dunigan (1994) therefore assumes that all sentential particles occupy a single position in the clause, which she terms the Sigma phrase, following Laka (1990). 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.

We are next concerned with the position of subject markers. In (12), a 3PL subject marker *ñu* 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 **góor gi** gis.
 Ali l-C_{WH} man DEF.SG see
 “The man saw ALI_{FOC}.”
- b. Aali l-a-**Ø** gis.
 Ali l-C_{WH}-3.PL see
 “He saw ALI_{FOC}.”

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

- a. góor g-u **Aali** gis
 man CM-C_{WH} Ali see
 “the man who Ali saw”
- b. góor g-u **mu** gis
 man CM-C_{WH} 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).

⁴The 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.

(16) Subject marker and lexical subject in subject focus

- a. **Aali**-a (>Aalee) gis xale bi.
 Ali-C_{WH} see child DEF.SG
“ALI_{FOC} saw the child.”
- b. **Mu**-a (>moo) gis xale bi.
 3SG-C_{WH} see child DEF.SG
“S/HE_{FOC} saw the child.”

(17) Lexical subject in a subject relative

- xale** b-i gis Aali
 child CM-C_{WH} see Ali
“the child who saw Ali”

No non-clitic element can ever intervene between the complementizer and the lexical subject or the subject marker.⁵ I therefore posit that the lexical subject/subject marker is located in the specifier of TP, which C takes as its complement.

In addition to sentence particles, Wolof also possesses a subordinating complementizer *ni* ‘that’, which can co-occur with sentence particles, in both non-extraction and extraction constructions, as in (18).

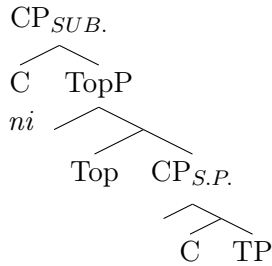
(18) Subordinating complementizer ni in Wolof

- a. Gëm na-nũ **ni** Aali gis na-∅ Musaa
 believe C_{AFF}-3PL that Ali see-3SG C_{AFF}-3SG Musa
“They believe that Ali saw Musa.”
- b. K-an l-a-nũ gëm **ni** l-a Aali gis?
 CM-Q l-C_{WH}-3PL believe that l-C_{WH} 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 signaling clause type (statements, questions, etc.), obligatory in every clause, and a subordinating particle, which introduces embedded clauses. Bhatt and Yoon (1992) propose that the category “Comp” be dissociated into two distinct categories – one that indicates clause-type (MOOD), and one that indicates subordination (SUBORDINATORS) – which some languages would conflate, and some keep separate. Following this type of an analysis, Wolof would belong to the second category, distinguishing sentential particles and a subordinating particle *ni*. 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 (possibly Foc). I do not take a specific stand on this issue, but assume two C heads in Wolof, a higher one which hosts only the subordinating complementizer *ni*, and a lower one which hosts all sentence particles, as in (19).

⁵Russell (2006) argues that object and locative clitics in Wolof undergo syntactic movement to Spec,TP, tucking under the subject. Then phonological reordering takes place, positioning all clitics on the left edge of the TP, as they are enclitics on the C-domain. Therefore, the subject clitic precedes all other clitics, since it also undergoes phonological reordering. The lexical subject, however, appears to the right of the object and locative clitics.

(19) Two CP layers in Wolof



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 (Ka 1987; Ndiaye 1995). For example, the 3rd 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.

This section offered a basic description of those elements of Wolof clausal structure that are relevant to the present discussion. Additional clarifications are provided throughout the paper, as necessary. The remainder of the paper is concerned with the syntactic (§3 and §4) and post-syntactic (§5) analysis of the CP-layer in A'-movement in Wolof.

3 The Syntax of A'-extraction

Torrence (2005) shows that constructions with CM-*u* and those with *(l)a* both involve A'-movement.⁶ Both forms signal agreement in the Wh-feature, and the use of one or the other allomorph correlates with Case agreement (i.e. subject/non-subject asymmetry marking) and ϕ -agreement, respectively. At first glance, their distribution appears to be fairly simple: some A'-movement constructions occur only with *(l)a*, and some only with CM-*u*, suggesting that they may be syntactically or featurally distinct. In *wh*-questions, however, both variants of C_{WH} can appear, with no difference in meaning or use. More importantly, even in *wh*-questions, there are cases in which CM-*u* and *(l)a* are in complementary distribution. I therefore argue that the difference between them is not syntactic, or featural, but that the clue to the explanation of their distribution lies in an important distinction between the CP-layers of the two types of A'-movement constructions, having to do with the overtiness of the phrase in Spec,CP, and the ϕ -feature in C. I offer a post-syntactic analysis of the surface differences in the CP-layer in §5. This section argues that constructions with one or the other complementizer variant have identical syntax, and that the two versions of C_{WH} are allomorphs. In 3.1, I discuss the basic distribution of CM-*u* and *(l)a*, and in 3.1-3.4, I present evidence for a unified syntax of the two structures.

3.1 Basic distribution of CM-*u* and *(l)a*

I propose that C_{WH} in Wolof, in all constructions, has the feature specification in (20): it has uninterpretable Wh-, T-, and ϕ -features. It also has an EPP feature, which requires the *wh*-phrase

⁶They are sensitive to islands, exhibit reconstruction effects, and pass a Wolof-specific A'-movement test. For details, see Torrence 2005, 2012a.

to move to Spec,CP.⁷

(20) Feature specification of C_{WH}

$$\begin{bmatrix} C_{WH} \\ uWh \\ uT \\ u\varphi \\ EPP \end{bmatrix}$$

C_{WH} occurs in a variety of sentence types: *wh*-questions, exhaustive focus constructions, relative clauses, comparatives and copular sentences. Aside from *wh*-questions, which can contain either *(l)a* or CM-*u*, in all other structures the two allomorphs are in complementary distribution. I only discuss representative examples from each of the two categories: exhaustive focus constructions and relative clauses. Table 1 summarizes the distribution of *(l)a* and CM-*u* in the relevant environments.

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

Table 1: The distribution of CM-*u* and *(l)a*

Examples in (21) illustrate *wh*-questions with *(l)a*. The two examples also show the subject/non-subject asymmetry that this complementizer exhibits: it surfaces as *a* in case of subject extraction and as *la* in case of non-subject extraction.

- (21) a. Subject question with *(l)a*
K-an **a** gis Musaa?
CM-Q C_{WH} see Musa
“Who saw Musa?”
- b. Object question with *(l)a*
L-an **l-a** Musaa gis?
CM-Q $l-C_{WH}$ Musa see
“What did Musa see?”

Questions equivalent in meaning to those in (21a) and (21b) can also be formed with CM-*u*, as in (22a) and (22b).⁸

- (22) a. Subject question with CM-*u*
K-u gis Musaa?
CM- C_{WH} see Musa
“Who saw Musa?”
- b. Object question with CM-*u*
L-u Musaa gis?
CM- C_{WH} Musa see
“What did Musa see?”

Wh-questions with CM-*u* 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,

⁷In 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.

⁸Wolof 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 class marker morpheme is glossed as CM.

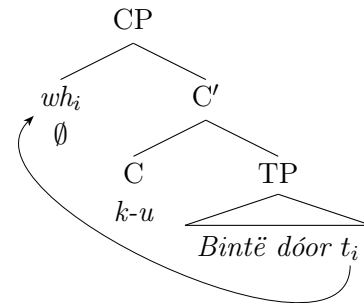
2012b). The CM-*u* complementizer can be formed with any of the thirteen noun class markers, requiring the answer to contain an item from that noun class. Both CM-*u* and (*l*)*a* can also occur in embedded questions.

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 (*l*)*a*. However, Torrence (2005, 2012a,b), presents extensive evidence in favor of treating CM-*u* as a complementizer with a null *wh*-phrase in its specifier, as in (23).

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

- a. K-u Bintë dóor?
 \varnothing -C_{WH} Binta hit
 “Who did Binta hit?”

b.



I follow Torrence in considering CM-*u* to be a complementizer, however, I argue in §5 that the obligatorily empty Spec,CP is the result of post-syntactic processes, and not a selectional property of CM-*u*. I do not discuss all of Torrence’s evidence for treating CM-*u* as a complementizer; the interested reader is directed to Torrence 2005, 2012a,b. My goal here is to establish a syntactic parallel between constructions with CM-*u* and (*l*)*a* in support of an analysis according to which constructions with (*l*)*a* have the same syntax as those with CM-*u*. In the remainder of this section, I give three arguments for this claim. First, we shall see that allomorphy is independently needed to account for different forms of CM-*u* in relative clauses. Next, when an overt DP must be present in Spec,CP, as in questions with complex *wh*-phrases, only (*l*)*a* can occur in C_{WH}, never CM-*u*. And finally, long distance extraction is possible only with (*l*)*a*, strongly suggesting that it is an A’-movement complementizer. In the final part of this section, I entertain an existing alternative analysis (Torrence 2005, 2013, to appear), according to which (*l*)*a* is a copula, and offer compelling evidence against it.

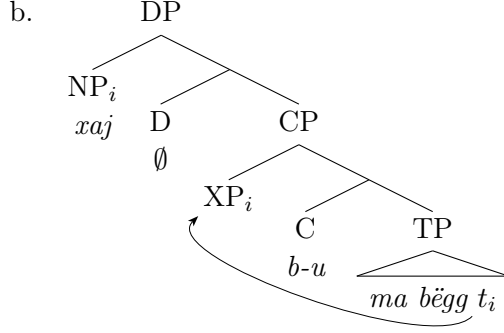
3.2 Allomorphy is independently needed

As it turns out, an allomorphy-based analysis is already needed to account for different forms of CM-*u* that occupy C in Wolof relative clauses.⁹ I assume that Wolof relative clauses, as in (24a), have the syntax in (24b): a relative operator co-indexed with the head noun is located in Spec,CP, and the relative CP is the complement of D. I justify this syntax in §5.4.

(24) The syntax of Wolof relative clauses

- a. Xaj **b-u** ma bëgg.
 dog CM-C_{WH} 1SG like
 “a dog that I like”

⁹CM-*u* also occurs in temporal clauses and conditionals, which are a type of relative clause (Torrence 2012a). In this paper I restrict the discussion to relative clauses, assuming that the analysis extends to temporal and conditional clauses.



In addition to noun class, in relative clauses C_{WH} encodes definiteness and proximity, having three allomorphs – CM-*u*, CM-*i* and CM-*a*. Determiners¹⁰ have similar forms in Wolof, *a*-CM (or in some dialects *u*-CM) being the indefinite one, and CM-*i* and CM-*a* the definite ones, with the former denoting a spatially proximal entity, and the latter a distal one. The indefinite determiner is usually omitted.

- (25) 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).¹¹ It must also be pointed out that the determiner of the DP containing the head noun and the relative marker normally do not co-occur, shown in (26).¹²

¹⁰Wolof 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.

¹¹The 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 §5.

¹²According to Torrence (2012a,b), the determiner can optionally surface on the edges of the relative clause, as in (i). (example from Torrence 2012a, p.103).

- (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. My analysis does not hinge on the exact position of the determiner, as I assume that a mechanism different from the OCP_ϕ is involved in regulating the cooccurrence of C and D. For details, see §5.

(26) Relative clauses and definite determiners in Wolof

- a. (*a-b) xaj **b-u** ma bëgg
 INDEF-CM dog CM-C_{WH} 1SG like
 “a dog that I like”
- b. xaj (*b-i) **b-i** ma bëgg
 dog CM-DEF.PROX CM-C_{WH} 1SG like
 “the dog (here) that I like”
- c. xaj (*b-a) **b-a** ma bëgg-oon
 dog CM-DEF.DIST CM-C_{WH} 1SG like-PST
 “the dog (there) that I liked”¹³

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 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 (26b) and (26c), 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 (26a), which is prenominal, and which differs in form from the complementizer.¹⁴ I therefore propose that C in relative clauses, in addition to the φ -feature, carries the definiteness and proximity features. For present purposes, I assume that definiteness is part of the φ -feature complex which participates in φ -agreement. In §5 I make a tentative proposal for a mechanism which regulates the cooccurrence of D and C in relative clauses.

The data from relative clauses show that allomorphy is independently needed to account for three different variants of the φ -agreeing C_{WH}, which encode definiteness and proximity. Therefore, one of the benefits of the present account is that it represents the extension of an existing analysis.

3.3 Pied-piping

An important piece of evidence for the parallel treatment of CM-*u* and (*l*)*a* comes from *wh*-questions which can contain both variants of C_{WH}, as can be seen in (21) and (22). Crucially, that is only possible when the *wh*-phrase consists only of one word. Questions with complex *wh*-phrases can only be formed with the complementizer (*l*)*a*, as shown in (27) and (28). CM-*u* is banned.¹⁵

Questions with a complex wh-phrase

- | | |
|--|---|
| <p>(27) a. Jaaj-u k-an l-a Aali gis? mother-of CM-Q <i>l</i>-C_{WH} Ali see “Whose mother did Ali see?”</p> <p>b. *Jaaj-u k-u Aali gis? mother-of CM-C_{WH} Ali see</p> | <p>(28) a. B-an xale l-a Faatu gis? CM-Q child <i>l</i>-C_{WH} Fatou see “Which child did Fatou see?”</p> <p>b. *B-an xale b-u Faatu gis? CM-Q child CM-C_{WH} Fatou see</p> |
|--|---|

¹³In my data, CM-*a* is always accompanied by the past tense morpheme *-oon* on the verb, indicating that the state or event is removed in time from the moment of speaking.

¹⁴It also cannot account for Torrence’s data, in which the determiners can optionally surface on the edges of relative clauses.

¹⁵Torrence (2012a) reports that there is variation in whether CM-*u* can occupy C_{WH} in these types of questions. I have found no variation amongst speakers from Saint Louis and Dakar, but I address Torrence’s data in §5 in more detail and show that my analysis can easily be extended to account for them as well.

It is, however, not the case that all phonologically overt material is banned from Spec,CP of structures with the allomorph CM-*u*. Both CM-*u* and (*l*)*a* can pied-pipe the locative preposition *ci* (Torrence 2012a):¹⁶

(29) Preposition pied-piping in Wolof

- a. {Ci fan}/{Fan ci} la ñu teg tééré bi?
 {P-LOC where}/{where P-LOC} *l*-C_{WH} 3PL put book DEF.SG
“On what did they put the book?”
- b. Ci l-u ñu teg tééré bi?
 P-LOC CM-C_{WH} 3PL put book DEF.SG
“On what did they put the book?”

Examples in (27), (28) and (29) show that it is only the phrase containing the *wh*-feature that is banned from Spec,CP of A'-structures with CM-*u*. I take the fact that constructions with both allomorphs behave identically with respect to preposition pied-piping as another indication that they are syntactically equivalent. *Wh*-questions with a complex *wh*-phrase in Spec,CP of CM-*u* are ungrammatical because the specifier of this allomorph cannot contain an overt DP. I give the details of the analysis in §5.

3.4 Long-distance extraction

Another property of (*l*)*a*, one that strongly favors an analysis which treats it as an A'-movement complementizer, 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 (30b) illustrates an attempt at extraction out of an embedded clause with the verb-focus particle *da*. Extraction is equally ungrammatical with CM-*u* and (*l*)*a* in the matrix clause, if the embedded clause retains the particle *da*. Long distance extraction out of the sentence in (30a) is only possible if (*l*)*a* occupies the embedded C_{WH}, as in (30c).¹⁷

(30) Verb focus particle and A'-extraction

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

Similarly, CM-*u* cannot occupy the C of an embedded relative clause; only (*l*)*a* is allowed:

¹⁶In *wh*-questions, *ci* can be both a preposition and a post-position. The fact that it can precede or follow the *wh*-word *fan* ‘where’, but cannot follow CM-*u*, is additional evidence that CM-*u* is not a question word.

¹⁷This 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.

(31) Relative Clauses

- a. film b-i ñu bëgg
movie CM-C_{WH} 1PL like
“the movie we liked.”
- b. film b-i mu wax-oon ni l-a-ñu bëgg
movie CM-C_{WH} 3SG say-PAST that l-C_{WH}-1PL like
“the movie that s/he said we liked”
- c. *film b-i mu wax-oon ni b-i ñu bëgg
movie CM-C_{WH} 3SG say-PAST that CM-C_{WH} 1PL like

In this respect, *(l)a* is similar to the Irish complementizer *aL*, and provides evidence for the cyclic nature of A'-movement.¹⁸

The following picture emerges from comparing CM-*u* and *(l)a*. Both complementizer variants occur in A'-movement constructions. In one type, *wh*-questions, both versions are possible. In other structures only one is allowed, which correlates with the overtness of the phrase in Spec,CP. This is especially significant in *wh*-questions with complex *wh*-phrases, which in the dialect discussed in this paper cannot be formed with CM-*u*. Furthermore, *(l)a* obligatorily occurs in intermediate C positions in long-distance extraction, which is strongly reminiscent of the behavior of A'-complementizers in successive cyclic movement. The fact that certain dialects allegedly also allow the occurrence of CM-*u* in intermediate Cs, as discussed in footnote 18, strengthens the proposal that they are allomorphs of the same complementizer.

3.5 Alternative analyses

In this section, I have claimed that CM-*u* and *(l)a* are allomorphs of the same C_{WH}, and that the constructions in which they occur are syntactically identical. If that is the case, where do their differences come from, and why are they in complementary distribution in all structures but *wh*-questions with simple *wh*-phrases? I propose a post-syntactic explanation of these facts in §5, and here I entertain possible alternative analyses. One possibility is that *(l)a* has an additional feature, which restricts its use to particular environments. It has been claimed in the literature that *(l)a* is a focus marker (Dunigan 1994; Russell 2006). The syntactic parallel between focus constructions and questions would not be surprising. It has been observed that languages which have

¹⁸ 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). He only reports this for questions. 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):

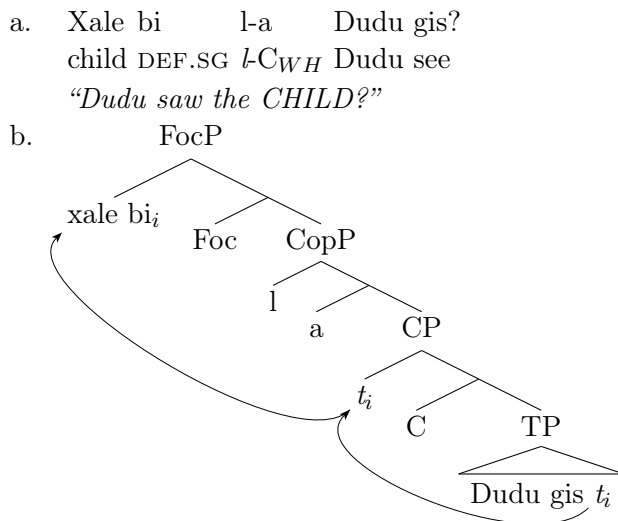
- (i) **K-u** Kumba wax ne **k-u** Isaa defe ne **k-u** Maryam di dóór?
CM-C_{WH} Kumba say that CM-C_{WH} Isa think that CM-C_{WH} Maryam AUX.FUT hit
“Who did Kumba say that Isa thought that Maryam will hit?”
- (ii) **K-u** Kumba wax ne **l-a** Isaa defe ne **k-u** Maryam di dóór?
CM-C_{WH} Kumba say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

I have not been able to confirm this data. For my consultants from Dakar and Saint Louis, Senegal, CM-*u* in intermediate C_{WH} 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_{WH}. Furthermore, the analysis I propose in §5 also accounts for his data.

a designated focus position tend to move their *wh*-phrases to that position as well (Horvath, 1986), and comparatives, which obligatorily contain *(l)a*, are also claimed to involve focusing (Reglero, 2006; Merchant, 2009).¹⁹ 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 way to A'-extract a constituent out of any clause-type is to focus it.²⁰ I therefore believe that the difference in the distribution of *(l)a* and CM-*u* does not lie in their featural makeup.

Another analysis of constructions with *(l)a* is that they are actually syntactically different from those with CM-*u*, even though they also involve A'-movement. In particular, it has been proposed that *(l)a* is a copula, due to the fact that it occurs in some copular sentences. I here briefly discuss the analysis put forth 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 focus construction in (32a) has the syntax in (32b):

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



This approach is in great part due to the fact that *(l)a* also occurs in copular constructions.²¹ I do

¹⁹See Baglini (to appear) for an analysis of Wolof comparatives.

²⁰But see Torrence (2013) on a proposal for successive-cyclic clefting in Wolof.

²¹In copular sentences a full DP always occupies the specifier of *(l)a*, just as in focus constructions, as in (i).

- (i) *Copular sentence in Wolof*
 Osmaan ndongo l-a-Ø.
 Osman student l-C_{WH}-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 copular sentences involve A'-movement of a DP to the specifier of *(l)a*. The analysis argued for in this paper extends to these constructions, as their CP-layer is syntactically identical to the one of focus constructions.

not explore the syntax of copular sentences here (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.²² 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*. 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 21. Next, the specifier of the copula *a* only allows an expletive, which is how Torrence analyzes *l-*, to occupy its specifier. If the expletive is there to satisfy the need of the copula to have a subject, it is not clear why, in certain cases, like object focus in the above example, the subject itself could not move there.²³ This is never possible; nothing can intervene between the extracted phrase and *(l)a*. And finally, copular sentences do not necessarily contain *(l)a*, as illustrated in the examples below. The example in (33) shows a copular sentence in a discourse narrative context. Such sentences differ from ordinary Wolof sentences in that they do not obligatorily contain a sentence particle, which, as was shown in §2, is a class of complementizer-like elements that the A’-movement complementizers belongs to. The absence of *(l)a* in such structures would be unexpected, if it was in fact a copula. *(L)a* is also absent in questions formed with CM-*u*, as in (34), and in a relative clause, in (35), since in final landing positions both CM-*u* and *(l)a* can occupy C_{WH}. Negative copular sentences also do not contain *(l)a*, but are formed with the negative sentence particle -*u*, which is in complementary distribution with other sentence particles, and therefore also with *(l)a*.

- | | |
|--|--|
| <p>(33) <u>Copular sent. in a narrative context</u> Usmaan di sàcckat. Ousman IMPF thief “Ousman is a thief.”</p> | <p>(34) <u>Copular sent. as a question</u> K-u di (>kuy) sàcckat? CM-C_{WH} IMPF thief “Who is a thief?”</p> |
| <p>(35) <u>Copular sent. in a relative clause</u> góor g-u di (>guy) sàcckat man CM-C_{WH} IMPF thief “a man who is a thief”</p> | <p>(36) <u>Negative copular sent.</u> Usmaan d-u sàcckat. Ousman IMPF-NEG.3SG thief “Ousman is not a thief.”</p> |

These facts, in addition to the parallels between constructions with CM-*u* and *(l)a*, and lack of any surface syntactic differences, aside from the shape of the CP-layer, reinforce the analysis which treats both elements as being realizations of the same A’-complementizer.

In this section, I have presented arguments for treating *(l)a* as an A’-movement complementizer, on a par with CM-*u*. Two key pieces of evidence are the behavior of *(l)a* and CM-*u* in long-distance

²²There are constructions in Wolof in which the verb raises out of the VP to the specifier of the sentence particle, in particular the particle *na* (Torrence 2005, 2012a). This is not such a case, as Torrence proposes that the copula *(l)a* is generated in a projection above TP. There is no evidence that *(l)a* starts in a lower position and then raises.

²³Torrence (2005) recognizes this problem himself.

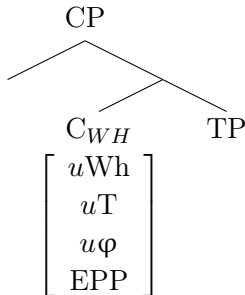
movement and in *wh*-questions with complex *wh*-phrases. In long-distance extraction, *(l)a* obligatorily occupies all intermediate C positions along the extraction path, giving evidence for the cyclic nature of A'-movement. In questions where Spec,CP is occupied by a complex *wh*-phrase, C can surface only as *(l)a*. Seeing how *wh*-questions with a simple *wh*-phrase can be formed with both CM-*u* and *(l)a*, I take the fact that they are in complementary distribution when a complex *wh*-phrase occupies Spec,CP to indicate that they are allomorphs of the same complementizer.

We are now left with two puzzles to solve. First, why do the subject/non-subject asymmetry and φ -agreement not surface simultaneously? Second, what determines their distribution in different constructions, i.e. why can C in questions with a simple *wh*-phrase surface as either of the allomorphs, in relative clauses only as CM-*u*, and in questions with complex *wh*-phrases, focus constructions and all embedded C positions only as *(l)a*? In §5 I argue that the shape of the CP-layer in Wolof is the result of the interface between the syntactic and post-syntactic component of the grammar. In particular, I propose that a markedness constraint is at play in Wolof, a morphological Obligatory Contour Principle, prohibiting adjacent φ -features in C_{WH} and its specifier. This configuration arises because C_{WH} agrees in φ -features with the extracted phrase. In my analysis, φ -agreement occurs in all A'-movement constructions, but due to the OCP-triggered deletion, we only observe it when the deletion targets the phrase in Spec,CP and the complementizer surfaces as CM-*u*. In the following section, I make explicit the morpho-syntactic details of the agreement patterns in A'-movement in Wolof, as the post-syntactic analysis depends on the assumptions about the syntax.

4 The Morphosyntax of A'-movement Effects in Wolof

In the previous section, I argue that all A'-movement constructions share the same syntax. This means that every C_{WH} has at least some of the same features, specified in (37).²⁴

(37) Feature Specification of C_{WH} in Wolof



The analysis according to which all A'-extraction effects are the result of agreement reinforces the post-syntactic analysis I propose in §5. Namely, agreement results in featural identity, and in spec-head agreement configurations the identical features are adjacent. Various dissimilations in different modules of the grammar militate precisely against adjacent identity in particular morphosyntactic configurations, as identified in various languages (e.g. Nevins 2007, 2012; Ackema and Neeleman 2004). We therefore expect OCP effects to arise precisely in the type of rich agreement configurations as is the CP-layer in Wolof A'-movement. Since this paper argues that the shape of the CP-layer in A'-movement in Wolof is the result of the interaction between syntax and post-syntax, in this section I lay out the details of the syntactic derivations and the resulting morphology.

²⁴ C_{WH} in different A'-movement constructions can of course also have additional features. In the analysis I propose they do not play a role in the pronunciation of the CP-layer.

The complementizer’s uninterpretable features must be valued via Agree (and in certain cases Move), and the A’-extraction effects we observe are the morphological reflex of agreement relations that C_{WH} establishes with different elements of the clause. One effect is the agreement between C_{WH} and the extracted phrase in φ -features, to check $u\varphi$ on C_{WH} , displayed as a class marker on the complementizer allomorph CM-*u*:

- (38) a. Subject question with CM-*u*
K-u gis Musaa?
CM- C_{WH} see Musa
“Who saw Musa?”
- b. Object question with CM-*u*
L-u Musaa gis?
CM- C_{WH} Musa see
“What did Musa see?”

This type of agreement occurs long-distance; in (39), it is present at the top of the dependency. In the variety of Wolof discussed in this paper, CM-*u* cannot occur in intermediate positions of long-distance extraction, though Torrence (2005, 2012a,b) reports that some dialects allow this (see footnote 18).

- (39) Long-distance extraction with CM-*u* in final position
K-u ñu gëm ni l-a Musaa xalad ni l-a Aali gis?
CM- C_{WH} 1PL believe that l- C_{WH} Musa think that l- C_{WH} Ali see
“Who do we believe that Musa thinks that Ali saw?”

As (39) shows, intermediate C_{WH} positions must be occupied by the allomorph (*l*)*a*. This variety of C_{WH} does not show φ -agreement, but exhibits a subject/non-subject asymmetry – it surfaces as *a* in subject extraction, as in (40a), and as *la* in non-subject extraction, in (40b). The asymmetry is local: as can be seen from (41), it only occurs at the bottom of the dependency, on the C_{WH} local to the extraction site.

- (40) a. Subject focus with (*l*)*a*
Aali **a** (>Aalee) gis Musaa
ali C_{WH} see Musa
“ALI_{FOC} saw Musa.”
- b. Non-subject focus with (*l*)*a*
Musaa **l-a** Aali gis
Musa l- C_{WH} ali see
“Ali saw MUSA_{FOC}.”

- (41) 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_{WH} -1SG believe that l- C_{WH} Musa think that 3SG C_{WH} 3PL.OBJ see
“I believe that Musa thinks that ALI_{FOC} saw them.”

I follow Pesetsky and Torrego (2001) and analyze the *a/la*-asymmetry as a T-C asymmetry, and propose an agreement-based analysis for this phenomenon in Wolof. In subsection §4.1, I justify the view that A’-movement effects are all agreement effects. My analysis is restricted to Wolof, and it remains to be seen to what extent it can be applied to similar effects in other languages. In §4.2, I give the details of the analysis.

4.1 A’-movement Effects as Agreement

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 2001, 2002). Another A'-movement effect reflects agreement between the complementizer and the *wh*-operator and/or the trace in its specifier, usually in φ -features, as, for example, in Kinande (Schneider-Zioga 1995, 1996, 2000, 2007). That these effects involve agreement between C and the extracted phrase is not controversial; that the third A'-extraction phenomenon in Wolof, the subject/non-subject asymmetry, is also a reflex of agreement is less agreed upon. This is the claim I am making, following Pesetsky and Torrego (2001) and their analysis of the *that*-trace effect in English. Specifically, I argue that C_{WH} has an uninterpretable T-feature which can be checked either by T-to-C movement, in non-subject extraction, yielding *la*, or by the moved subject itself, which carries a T-feature in the form of Nominative case, resulting in the C_{WH} surfacing as *a*. The crucial part of this analysis is that it predicts additional morphological material in C in case of non-subject extraction. This is exactly the situation we observe in Wolof. In my analysis, *l-* that occurs in C_{WH} in case of non-subject extraction is the morphological realization of T in C.

An important cross-linguistic property of A'-extraction effects, one that motivates an agreement-based analysis for all of them, is that agreement between C and the extracted phrase in the Wh-feature and/or the φ -feature occurs long-distance or in a cyclic fashion along the entire path of A'-movement, while the various subject/non-subject asymmetries are always local, limited to the clause in which the extracted phrase originates.²⁵ In Wolof, φ -agreement occurs only in final landing sites of A'-movement, never in intermediate positions (but see footnote 18). This is nothing unusual; just because a language has an agreeing complementizer, it does not mean that this agreement will show up in every C position. In Kinande, for example, the occurrence of a complementizer in intermediate positions is optional, but if the complementizer does occur, it exhibits φ -agreement (Schneider-Zioga 1995, 1996, 2007). In Chamorro (Chung 1998), the complementizer in A'-extraction alternates depending on the features of the operator in Spec,CP.²⁶ Crucially, 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. The fact that agreement between C and the operator in its specifier is not always cyclic can have various explanations: for example, A'-movement in Chamorro may not be cyclic. In §5, I attribute the absence of φ -agreement in intermediate C positions in Wolof to post-syntactic mechanisms that determine C selection.

The presence or absence of a locality effect follows straightforwardly from the nature of agreement. Consider, for example, local extraction schematized in (42), 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*.

- (42) *Local extraction*
 a. [CP C[*uF*] ... DP[*iF*]]

²⁵This goes for all types of subject/non-subject asymmetries in A'-movement: those similar to the *that*-trace effect, but also anti-agreement effects, which on the surface look quite different, and are clearly tied to agreement (Ouhalla 1993, 2005; Henderson 2007, 2013).

²⁶Whether 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.

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

C can check its uF against the corresponding feature in both (42a) and (42b); 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 (43), is different.

- (43) 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 (43a), but not in (43b). 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 (43b) must be checked by some other means. In other words, only interpretable features can participate in long-distance agreement relations.

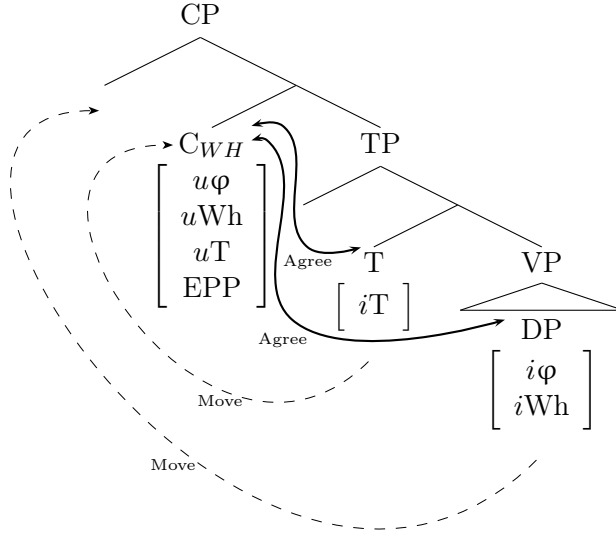
In the remainder of this section, I go through the details of the morphosyntax of A'-extraction effects in Wolof.

4.2 The Subject/Non-subject Asymmetry in Wolof

The most important novelty of my analysis is the treatment of the *a/la*-asymmetry as T-C agreement, following Pesetsky and Torrego (2001) (P&T). The key assumption that the analysis is based on is that C_{WH} has an uninterpretable T-feature, which can be checked either by Head Movement of T to C, or by movement of the subject to Spec,CP. The reason why the subject can check uT on C_{WH} is that it carries Nominative Case, which Pesetsky and Torrego (2001) argue is uT on D.

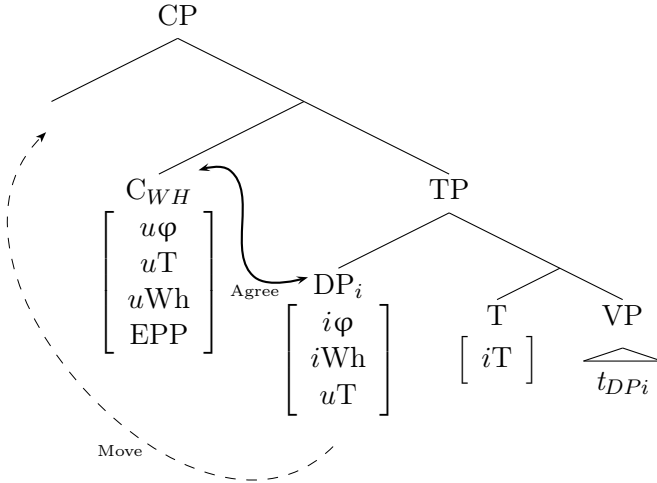
The tree in (44) illustrates agreement relationships that C_{WH} enters into in non-subject extraction. In order to value its uninterpretable φ - and Wh-features, it establishes agreement with the non-subject phrase in its c-command domain, which has interpretable φ - and Wh-features. This phrase also moves to Spec,CP, because C_{WH} has an EPP feature. In order to check its uninterpretable T-feature, C_{WH} establishes Agree with T, which then undergoes Head Movement to C_{WH} .

(44) C's Agreement Patterns in Non-Subject Extraction



In case of subject extraction, as in (45), the agreement pattern is somewhat different. C_{WH} agrees with the subject phrase in order to check $[u\varphi]$ and $[uWh]$, but since the subject phrase also carries a valued $[iT]$, it can value $[uT]$ on C_{WH}.

(45) C's Agreement Patterns in Subject Extraction



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,²⁷ 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.

²⁷Meaning that the feature must be valued via both Agree and Move.

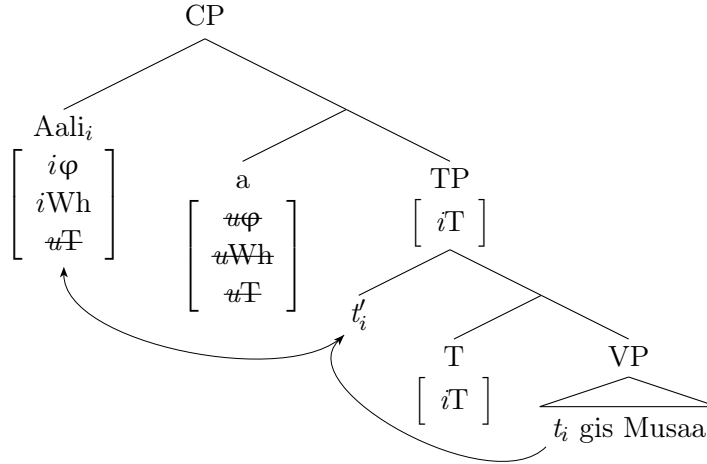
I proposed that C_{WH} in Wolof, in addition to having an uninterpretable Wh- and φ -features, also has a uT feature. Adopting P&T's assumption that nominative case is uT on D, we expect the sentence in (46a) to have the structure in (46b), before the movement of the focused phrase:

(46) Subject extraction

- a. Aali **a** (>Aalee) gis Musaa.
 Ali C_{WH} see musa
 “ ALI_{FOC} saw Musa.”
- b. $[C a_{uT, uWh, u\varphi}] [TP Aali_{uT, iWh, i\varphi} iT [VP gis Musaa]]$

The subject in (46b) is already attracted to Spec,TP by T's need to check its uninterpretable φ -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 in the following way. C bears uWh and uT , with an EPP feature. 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. Since the nominative phrase already moves to Spec,CP to check $u\varphi$ and uWh , uT can also be deleted. The ECONOMY CONDITION prevents unnecessary movement to take place, and bans T-to-C.

(47) Subject extraction as uT valuation



On the other hand, if a non-subject is extracted, as in (48), the extracted constituent has only the iWh and $i\varphi$ features. The structure after C has merged with TP is shown in (48b).

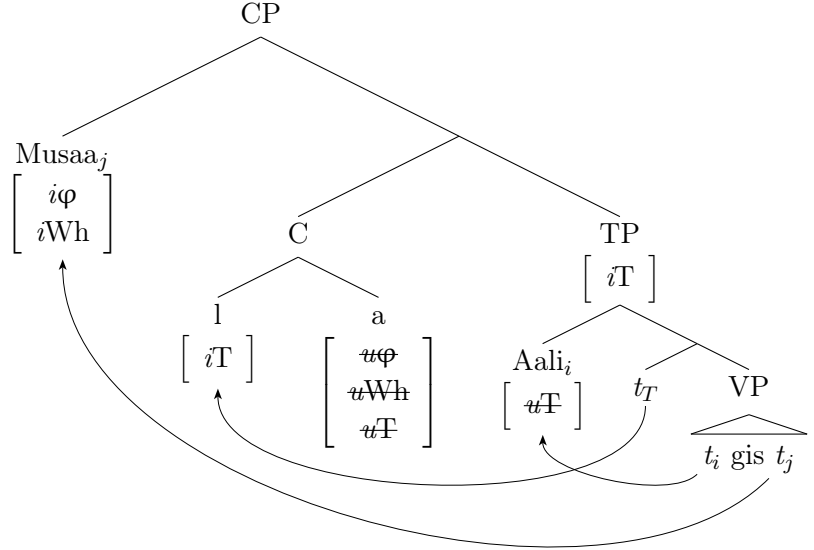
(48) Object extraction

- a. Musaa **l-a** Aali gis
 musa $l-C_f$ ali see
 “ Ali saw $MUSA_{FOC}$.”
- b. $[C a_{iT, uWh, u\varphi}] [TP Aali_{iT} iT [VP gis Musaa_{iWh, i\varphi}]]$

The closest constituent that can value an uninterpretable feature on C is the TP or its specifier, so ATTRACT CLOSEST forces C to delete one of its uninterpretable features (uT) by attracting the closest constituent. In Wolof, the only option is to attract the TP, which according to the Head

Movement Generalization is realized as Head Movement of T to C. This does not value uWh on C, which 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 (49).²⁸

(49) 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.

A question that needs addressing is why C in sentences like (48) cannot choose between Spec,TP and TP (i.e. its head), to delete uT . In other words, why is the sentence in (50) not a possible way to focus an object?

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

*Musaa Aali **a** (<Aalee) gis
 Musa Ali C_{WH} see
 intended: “*Ali saw MUSA_{FOC}.*”

From the ungrammaticality of (50), the following appears to be true of the $(l)a$ in Wolof: (i) the phrase carrying the Wh -feature must occupy the specifier of $(l)a$, and (ii) $(l)a$ 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.²⁹

This analysis improves on Pesetsky and Torrego (2001) by finding an example of a language in

²⁸Overt material can still occur in T, in particular the past tense marker *-oon*. This analysis therefore assumes two things. First, l - is the Spell-Out of T in C, and not of T in T. Second, provided that *-oon* is generated in T, it presupposes that one feature can be spelled out in two positions. Multiple expression of a single element in different structural positions, as a result of A-movement, has been proposed, for example, for Clitic Doubling (Anagnostopoulou 2003; Harizanov To appear), and is similar to analyses of resumption in languages where the resumptive pronoun behaves as a phonetically realized trace of movement (Engdahl 1985; Demirdache 1991).

²⁹See Pesetsky and Torrego (2001) for arguments that this is a possible derivation in English, with consequences for interpretation.

Let us now turn to long distance movement. 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 (51) illustrates the extraction of an embedded focused subject.

- In (51), 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 *I*-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 *I*- 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 this section I have offered an analysis of the subject/non-subject asymmetry in Wolof A'-movement constructions by analyzing it as a T-to-C asymmetry along the lines of Pesetsky and Torrego 2001. I argue that *l*-, which precedes *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 *u*T on D, and as such capable of deleting *u*T on C by moving to its specifier. Since in those cases the subject also deletes *u*Wh 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 investigated agreement patterns of C, exhibited by its two allomorphs, CM- u and $(l)a$. Table 2 repeats their distribution in the variety of Wolof discussed in this paper.

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

Table 2: The distribution of complementizers CM- u and a in Wolof.

Two puzzles remain to be solved. First, why do the subject/non-subject asymmetry and agreement in φ -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.

5 A'-Complementizer Allomorphy

In §3 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 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 proposed that C_{WH} in Wolof has the feature specification in (52) and discussed the details of the analysis in §4: the C head needs to establish agreement both in φ -features, and with T, to check its uninterpretable φ - and T-features. Furthermore, it has an EPP feature, which requires the phrase with the *Wh*-feature to move to Spec,CP.

(52) The feature specification of C_{WH}

$$\begin{array}{c} C_{WH} \\ \left[\begin{array}{c} uWh \\ u\varphi \\ uT \\ EPP \end{array} \right] \end{array}$$

As we have seen, the two allomorphs of C_{WH} do not each overtly exhibit all agreement features: CM- u shows Wh- and φ -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 φ -feature (i.e. the class marker) in C, which in turn depends on the presence or absence of the φ -feature in Spec,CP. The data show that the φ -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 Spec,CP is null; if Spec,CP is overt (and therefore contains the φ -feature), the complementizer surfaces as $(l)a$.

Restrictions on the co-occurrence of the *wh*-phrase in Spec,CP and the complementizer in C are well known from English, German, French etc., as the Doubly-Filled-Comp-Filter (Chomsky and Lasnik 1977). The Wolof case is similar, but it is only in constructions where C_{WH} allomorph overtly exhibits φ -feature agreement that the *wh*-phrase is obligatorily absent from Spec,CP. I argue that the restriction on φ -feature co-occurrence in the specifier-head configuration in A'-movement is the result of two post-syntactic constraints: the Obligatory Contour Principle, which prohibits adjacent identical features, and Recoverability, which prohibits the deletion of unrecoverable material. This section is dedicated to spelling out the details of this analysis.

5.1 OCP_φ

The φ -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 φ -features to surface in a specifier-head configuration, as in (53).

(53) Morphological Obligatory Contour Principle constraint in Wolof

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

The repair to the OCP violation is to delete the φ -feature node in C, or to delete the entire phrase in Spec,CP. I furthermore propose that φ 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 §4), T is adjoined to C above φ . The structure of C in subject and non-subject extraction is represented in (54) and (55), respectively.

(54) C in subject extraction

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

(55) C in non-subject extraction

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

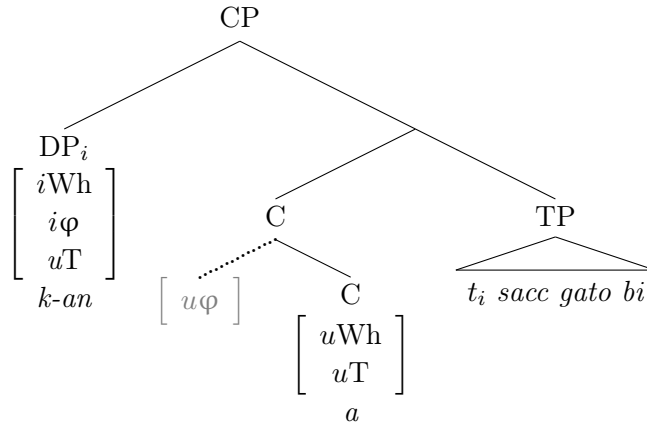
I also propose the following set of Vocabulary Insertion rules. In the environment of φ , C surfaces as *u*, and as *a* elsewhere. T surfaces as *l* when adjacent to C.

(56) Vocabulary Insertion Rules, first version³⁰

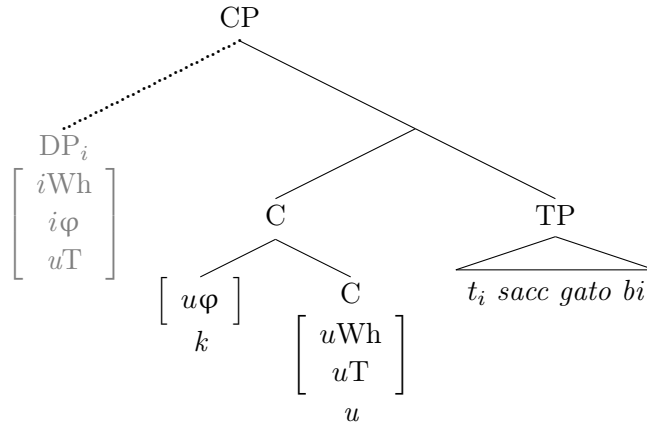
- a. $C_{WH} \rightarrow u/\varphi ___$
- b. $C_{WH} \rightarrow a$

³⁰The Vocabulary Insertion rules will need to be made slightly more precise to account for versions of the complementizer in relative clauses.

(59) a. Subject a-question



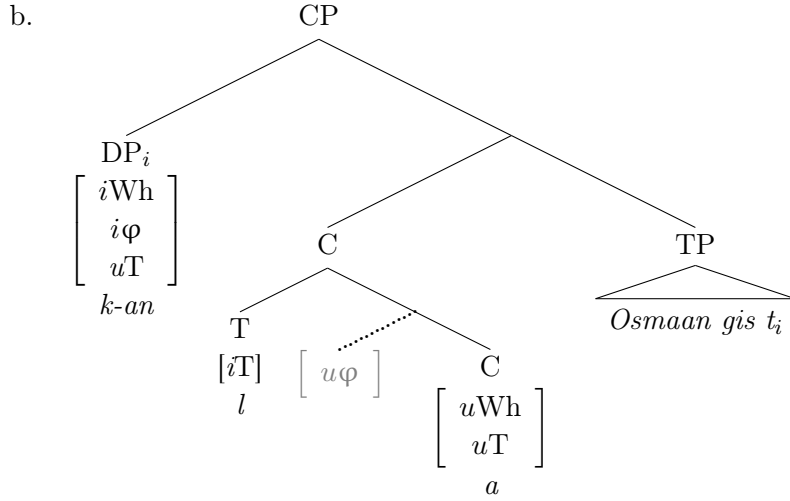
b. Subject u-question



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.

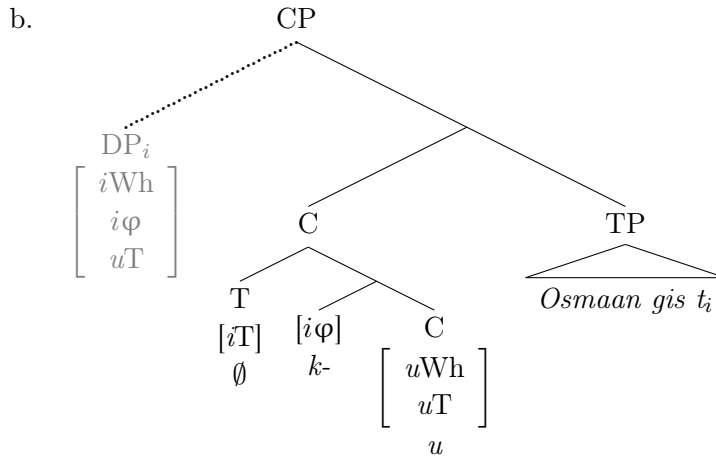
(60) Non-subject a-question

- a. K-an l-a Osmaan gis?
 CM-Q *l*-C_{WH} Osman see
 “Who did Osman see?”



(61) Non-subject u-question

- a. K-u Osmaan gis?
 CM-C_{WH} Osman see
 “Who did Osman see?”



Under the analysis developed here, we do not need to stipulate 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 φ -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. 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 delete identical features of terminal nodes

contained within the same prosodic domain in subject-verb agreement in languages such as Dutch and Arabic, resulting in *weakened* agreement on the verb: 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_φ markedness constraint prohibits φ -features in adjacent nodes (in a Specifier-Head configuration), as in (53).

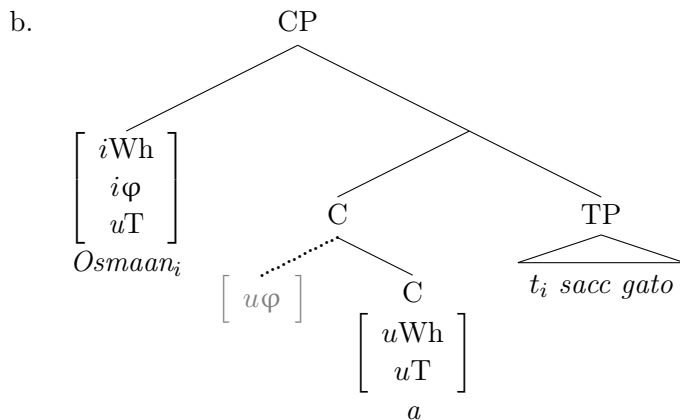
We now have an account of the two versions of *wh*-questions with simple *wh*-phrases, which are the only A' -movement construction which can occur with either of the A' -complementizer allomorph, CM-*u* and $(l)a$. In all other constructions, only one of the allomorphs is allowed. In the following sections,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

5.2 Recoverability

The only option of avoiding an OCP_φ violation in focus constructions and comparatives is to delete the φ -feature in C, causing those structures to always surface with $(l)a$, as in extraction of a focused subject illustrated in (62), and of a focused non-subject in (63).

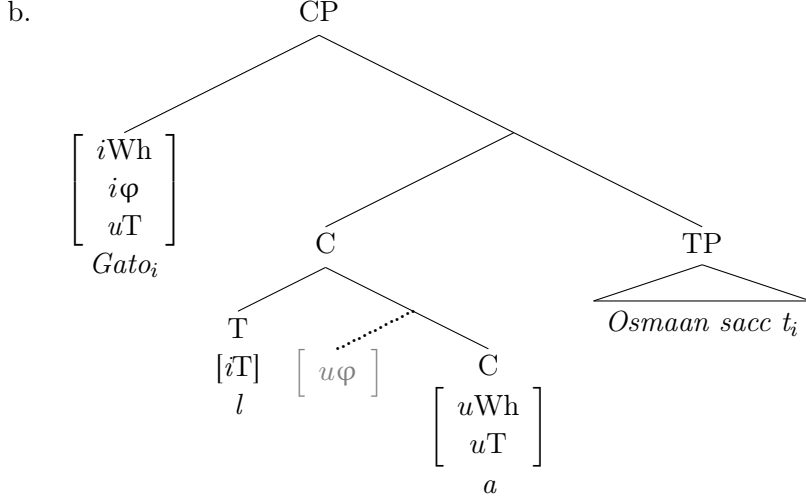
(62) Subject focus

- a. Osmaan_{*i*} a *t_i* sacc gato.
 Osman_{*i*} C_{WH} *t_i* steal cake
 “OSMAN_{FOC} stole a cake.”



(63) Non-subject focus

- a. Gato l-a Osmaan sacc.
 cake l-C_{WH} Osman steal
 “Osman stole a CAKE_{FOC}”



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 simple *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 ϕ -feature is deleted from one of the nodes in an agreement configuration. Focus structures 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 (64).

- (64) Complex *wh*-questions can only contain $(l)a$
- | | |
|---|--|
| <p>a. B-an xale l-a Faatu gis? CM-Q child l-C Fatou see <i>“Which child did Fatou see?”</i></p> | <p>b. *B-an xale b-u Faatu gis? CM-Q child CM-C Fatou see</p> |
|---|--|

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 (65).

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

The ungrammaticality of (65) is in my analysis the result of the target of the Impoverishment rule, which is the whole phrase in Spec,CP containing the offending feature.³²

³²According to Torrence (2012a), for some speakers a null *wh*-phrase can pied-pipe an NP to Spec,CP in questions:

There is a case in which the specifier of CM-*u* can contain some overt material. The locative preposition *ci/si* can be pied-piped to Spec,CP, and both CM-*u* and *(l)a* can occupy C_{WH} (Torrence 2012a):

(66) *Preposition pied-piping in Wolof*

- a. {Ci fan}/{Fan ci} la ñu teg tééré bi?
 {P-LOC where}/{where P-LOC} *l*-C_{WH} 3PL put book DEF.SG
“On what did they put the book?”
- b. Ci l-u ñu teg tééré bi?
 P-LOC CM-C_{WH} put book DEF.SG
“On what did they put the book?”

This shows that the Obliteration rule targets only the DP which contains the φ -feature.

I have now offered an analysis for the occurrence of both allomorphs in *wh*-questions, and the obligatoriness of *(l)a* in focus constructions. Recall the distribution of CM-*u* and *(l)a* in A'-movement constructions in Wolof, repeated here in Table 3.

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

Table 3: The distribution of complementizers CM-*u* and *(l)a* in Wolof.

In the remainder of this section, we look at very different data, which may seem to contradict the proposed analysis. 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 φ in C that must delete. This is also surprising, 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 _{φ} and Recoverability. My analysis can explain both cases.

- (i) *Null wh-phrase in a question with CM-u*
 %Picc **m-u** xale y-i dáq?
 bird CM-C_{WH} child CM.PL-DEF chase
“Which bird did the children chase?”

All speakers from Saint Louis and Dakar that I have consulted judge this to be ungrammatical as a question. However, my analysis can be easily extended to account for this data. Dialectal variation in Impoverishment rules is not unusual; for example, in Basque (Arregi and Nevins 2007, 2012), 1st and 2nd person clitics trigger some type of dissimilation (in the [Participant] feature), but there is dialectal variation in how the violation is repaired. Similarly, in the variety of Wolof that Torrence reports, the Impoverishment rule would target only the *wh*-word, and not the entire phrase in Spec,CP.

5.3 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_φ violation in non-final CP-layer can only be avoided by deleting the φ -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 out of the spelled out domain. In successive-cyclic movement the derivation in which the phrase in Spec,CP is deleted crashes, because there is nothing left to be attracted by the higher C. As was mentioned in footnote 18, Torrence (2005, 2012a,b) also claims that there are dialects in which CM-*u* can occupy intermediate C positions. While I have not been able to confirm such data, my analysis can be modified to account for it by timing movement before Spell-Out in those dialects.

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 their 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. This crucially means that some syntax can happen after post-syntax. Let us examine the predictions of this proposal. Consider the sentence in (67).

- (67) Long-distance object extraction in Wolof
 $[_{CP2} \text{ K-an}_i \text{ l-a} \quad \text{Isaa wax ne } [_{CP1} t_i \text{ l-a} \quad \text{xaj bi} \quad \text{matt } t_i]]?$
 $[_{CP2} \text{ CM-Q } l\text{-C}_{WH} \text{ Isaa say that } [_{CP1} t_i \text{ l-C}_{WH} \text{ dog DEF bite } t_i]]$
 “Who did Isaa say that the dog bit?”

I first consider the option in which movement follows Spell-Out, as this is the variety of Wolof described in this paper. We start at the moment when the Spell-Out of the edge of the embedded CP-layer (CP1) is triggered by a higher phase head,³³ and the OCP_φ evaluates the resulting construction. This proceeds in the way explained above: either φ in C or the whole Spec,CP node can delete, resulting in the complementizer surfacing as either *(l)a* or CM-*u*, respectively:

- (68) Deletion of φ in C, Step1
 $[_{CP2} \text{ C } \dots [_{CP1} \text{ k-an}_i \text{ l-a} \quad \text{xaj bi} \quad \text{matt } t_i]]$
 $[_{CP2} \text{ C } \dots [_{CP1} \text{ CM-Q } l\text{-C}_{WH} \text{ dog DEF bite } t_i]]$
 “who did the dog bite?”

³³For simplicity of exposition, I assume that it is the higher C_{WH} head that triggers Spell-Out of the edge of the embedded CP phase.

- (69) Deletion of Spec,CP, Step1

$$\begin{array}{l} [_{CP2} C \dots [_{CP1} \emptyset k-u \quad \text{xaj bi} \quad \text{matt } t_i]] \\ [_{CP2} C \dots [_{CP1} \emptyset CM-C_{WH} \text{ dog DEF bite } t_i]] \\ \text{“who did the dog bite?”} \end{array}$$

Since in this derivation movement follows Spell-Out, the *wh*-phrase in CP1 is only attracted to the Spec,CP2 after the described post-syntactic processes have taken place. If φ -feature was deleted from C, as in (68), the *wh*-phrase is present in Spec,CP1 and can move to Spec,CP2, as in (70). The Spell-Out of the CP2 layer proceeds in the same way, with two possible outcomes:

- (70) Deletion of φ in C, Step2

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

If, however, the phrase in Spec,CP of CP1 is deleted as a result of OCP $_{\varphi}$ repair, as in (69), there is no *wh*-phrase left in the specifier of CP1 to move to Spec,CP2 in a dialect in which Spell-Out precedes movement. This derivation therefore crashes (in (71)), and the derivation in which φ 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.

- (71) Deletion of Spec,CP, Step2

$$\begin{array}{l} *[_{CP2} _ C \text{ Isaa wax ne} \quad [_{CP1} \emptyset k-u \quad \text{xaj bi} \quad \text{matt } t_i]] \\ [_{CP2} _ C \text{ Isaa say that } [_{CP1} \emptyset CM-C_{WH} \text{ dog DEF bite } t_i]] \end{array}$$

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 φ 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.³⁴ 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* or *CM-u*, as in (72), 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.

- (72) Successive cyclic movement follows Spell-Out

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

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

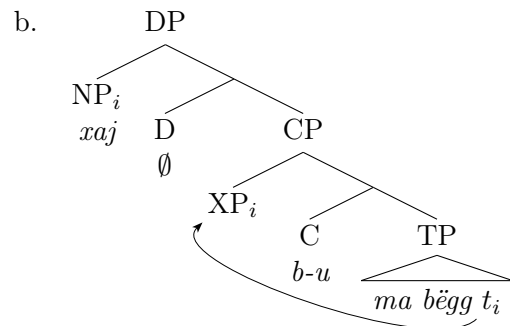
³⁴The fact that a higher copy of the move phrase exists does not affect Recoverability in the post-syntax, which only evaluates the immediate Spell-Out domain.

movement. Torrence (2005, 2012a,b) shows data in which CM-*u* is allowed in intermediate positions, alongside (*l*)*a* (see footnote 18), and, as expected if this analysis is on the right tract, he only reports such an option for *wh*-questions, never focus constructions. If such dialects do in fact exist, in them movement precedes Spell-Out. This analysis also accounts for the occurrence of what Torrence calls *mixed chains*, where CM-*u* and (*l*)*a* can interchangeably occupy embedded Spec,CP position, since in every CP, whether embedded or not, either of the two allomorphs of C_{WH} can surface. 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.

5.4 Relative clauses

Finally, let us examine the predictions of the analysis for C in relative clauses. I assume that Wolof relative clauses, as in (73a), have the syntax in (73b): a relative operator co-indexed with the head noun is located in Spec,CP, and the relative CP is the complement of D.

- (73) The syntax of Wolof relative clauses
a. Xaj **b-u** ma bëgg.
dog CM- C_{WH} 1SG like
“a dog that I like”



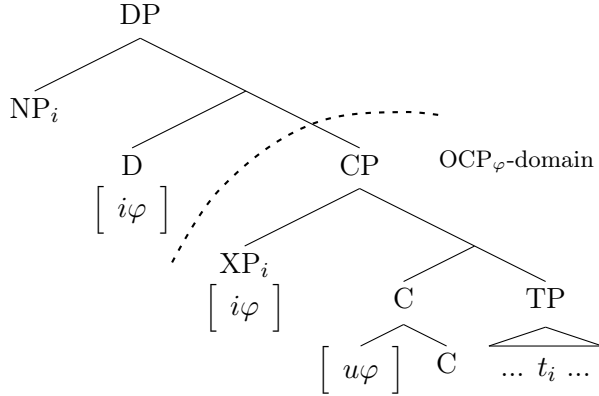
The reason for assuming a head-external representation of Wolof relative clauses is maintaining the generalization that Spec,CP of CM-*u* is always empty, as we have seen is the case in *wh*-questions. Torrence (2005, 2012a,b) advocates a structure for Wolof relative clauses in which the relativized 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. 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.³⁵ I abstract away from a more precise representation and leave it for further research and assume (73b) 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.

Since Spell-Out occurs in a cyclic fashion, I propose that the domain of the OCP_ϕ is the CP phase, as in (74), meaning that the ϕ -feature in D is not taken into consideration in evaluating

³⁵For 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).

markedness.

(74) Wolof relative clause and the domain of OCP_φ



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 §3.2 that the φ -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.³⁶ 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*, encoding definiteness and proximity of the head noun. The relevant examples are repeated in (75).

(75) The relative complementizer encodes definiteness and proximity

- a. (*a-b) xaj **b-u** ma bëgg
 (INDEF-CM) dog CM-C_{WH} 1SG like
 “a dog that I like”
- b. xaj (*b-i) **b-i** ma bëgg
 dog (CM-DEF.PROX) CM-C_{WH} 1SG like
 “the dog (here) that I like”
- c. xaj (*b-a) **b-a** ma bëgg-oon
 dog (CM-DEF.DIST) CM-C_{WH} 1SG like-PST
 “the dog (there) that I liked”

I therefore propose that C in relative clauses carries the definiteness-proximity feature complex, which it obtains in the process of φ -agreement. It 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:

³⁶As a result of whichever mechanism ensures co-indexing between the head noun and the relative operator.

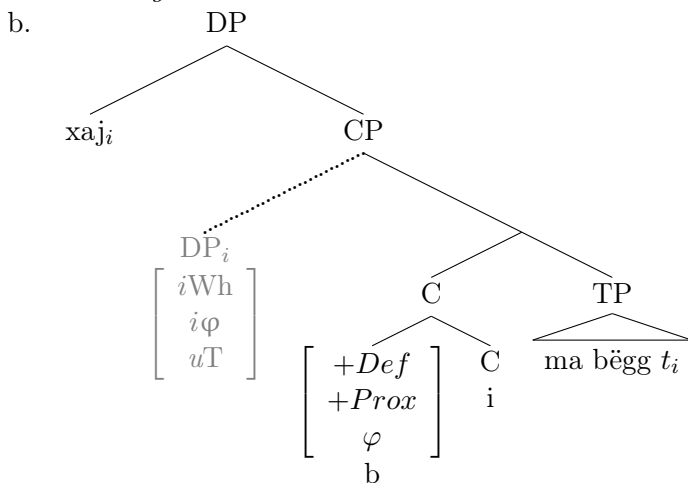
(76) *Vocabulary insertion rules, second version*³⁷

- $C[+Wh] \rightarrow u/\{\varphi, -Def\}___$
- $C[+Wh] \rightarrow i/\{\varphi, +Def, +Prox\}___$
- $C[+Wh] \rightarrow a/\{\varphi, +Def, -Prox\}___$
- $C[+Wh] \rightarrow a$
- $T \rightarrow l/___C$

I argue that the reason for the obligatory deletion of the relative operator in Spec,CP lies precisely in the fact that the feature complex in C of relative clauses does not only contain the φ -feature, but also definiteness and proximity. Recoverability therefore prevents the deletion of irretrievable material, protecting the deletion of φ in C. The only option, then, is to delete the operator in Spec,CP, which causes the φ -feature in C to be pronounced and the complementizer to surface as *-u*, *-i*, or *-a*, per the Vocabulary Insertion rules in (76).

Obligatory deletion of Spec,CP in relative clauses

- (77) a. xaj b-i ma bëgg
dog CM-C_{WH} 1SG like
‘the dog that I like’



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_φ constraint, which prohibits adjacent identical φ-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.

³⁷Technically, the Vocabulary Insertion rule in (76c) is not necessary, since the exponent for the definite distal complementizer is homophonous with the exponent for the elsewhere condition in (76d). I posit two rules to make the distinction between the two complementizer forms clearer.

6 Conclusion

In Distributed Morphology, some aspects of word formation take place in the syntax proper, while other aspects occur in the post-syntactic component, during Spell-Out. Processes that happen at PF are highly constrained and limited to minor manipulations of terminal nodes, such as feature or node deletion. They can nonetheless alter the surface output of syntax, creating the appearance of differences between structures that are syntactically identical. This paper adds to the body of work supporting this view of morphology by investigating the morphosyntax of A'-movement in the Niger-Congo language Wolof, and showing that surface distinctions in two A'-movement constructions can be reduced to the interaction of syntactic and post-syntactic processes, in particular agreement and dissimilation.

A'-movement in Wolof results in two seemingly syntactically distinct structures, which differ in the shape of the complementizer and the overtness of the phrase in Spec,CP. Furthermore, each of the complementizer variants exhibits a different agreement-based A'-extraction effect – CM-*u* shows φ -agreement and (*l*)*a* a subject/non-subject asymmetry, and it obligatorily marks the cyclicity of A'-movement. The two versions of C_{WH} are for the most part in complementary distribution: they both occur in *wh*-questions with a simple *wh*-phrase, but only one variant is allowed in all other A'-constructions, and their distribution does not correspond to any obvious syntactic or semantic differences. I therefore argue that the two variants of C_{WH} are allomorphs, meaning that all extraction effects are present in the syntax of each of them, but not observed on the surface due to post-syntactic processes.

The central part of the analysis presented in this paper lies in identifying the source of the distribution of the two C_{WH} allomorphs in Wolof in different constructions as post-syntactic. Namely, adjacent featural identity is known to trigger post-syntactic dissimilations. In Wolof, dissimilation targets the φ -feature, which, due to agreement, is found in C_{WH} and in Spec,CP. However, an overt φ -feature marker never surfaces both in C_{WH} and in Spec,CP. I argue this to be a consequence of a morphological Obligatory Contour Principle constraint, which prohibits the φ -feature from occupying two adjacent nodes. Repairs of such violations are language-specific, as are the constraints themselves. In Wolof, one of the nodes containing the φ -feature, either in C_{WH} or Spec,CP, is deleted. However, if either of the two contains content irretrievable in the CP-layer, its deletion is blocked, which results in a particular construction always surfacing with only one allomorph of C_{WH} .

This paper offers not only a unified analysis of A'-extraction effects and maintains a unified syntax of A'-extraction in Wolof, but crucially offers a principled account for the distribution of different shapes of the CP-layer in different instances of A'-movement.

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