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

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Contents

Abstract

This paper is concerned with the seemingly complex morphosyntax of A′-movement in the Niger-Congo language Wolof. Wolof exhibits three different A′-extraction effects: morphological marking of the cyclicity of movement, agreement in class between the *wh*-complementizer and the extracted phrase, and a subject/non-subject asymmetry, akin to the *that*-trace effect. The effects seem to surface in two seemingly different structural configurations, with their distribution not straightforwardly explainable as being of semantic of information-structural provenance. The analysis developed here advocates a unified syntax for all A′-structures in Wolof, and aims to show that their surface morpho-syntactic properties can be understood as resulting from the general mechanisms underlying the operation Agree, such as the presence of particular uninterpretable features and their location, and the interaction of agreement with post-syntactic processes, specifically an OCP-type effect, akin to the Doubly-Filled-COMP Filter, resulting in post-syntactic impoverishment and complementizer allomorphy. 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 in Wolof.

1 Introduction

An important question generative linguists try to answer is how diverse languages truly are. Proponents of universal grammar tend to believe that, when properly unpacked, a lot of apparent differences between languages arise from operations not having to do with narrow syntax, and that in fact most languages have a very similar underlying syntactic structure. The surface structure exhibits a lot of variation between different languages, some having its origin in syntactic processes, and some resulting from various processes that take place at the interface of syntax with other components of the grammar. This paper focuses on the interface of syntax and post-syntax (i.e. morphology) in A′-movement constructions in the Niger-Congo language Wolof, and elucidates the type of surface variation the interaction of these two modules can bring to the structure of the CP-layer.

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 complexity and cross-linguistic differences where in reality there are none. By looking more closely at the types of post-syntactic processes that occur in languages, we arrive at the conclusion that a lot of the complexity that we may be tempted to blame on language-particular syntactic behavior is in fact attributable to the interaction of the syntactic and the post-syntactic components. This is due to various operations occurring in post-syntax, affecting the output of syntax by deleting features, or even entire 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, and just as we see uniformity in syntactic processes, we also expect to see cross-linguistic similarities in morphological patterns. 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 contributes to this line of research, by arguing that the seemingly complex morphosyntactic structure of A′-movement in Wolof is, in a sense, completely unremarkable – there is nothing out of the ordinary about the syntax of A′-movement in Wolof. There is also nothing completely unique to Wolof in the post-syntactic component of its grammar. The processes which I argue are at work in its CP-layer are found in similar morpho-syntactic configurations (specifically, structurally adjacent elements in agreement relations) in various languages. It is thus the interaction of two orderly behaved modules—the syntactic and the post-syntactic one—that creates the appearance of syntactic variation. In the remainder of the introduction, I give an overview of the data and a summary of the analysis.

A′-movement in Wolof exhibits several morphosyntactic effects. What makes it especially interesting, and highly relevant for the discussion of the syntax-morphology interface, are 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* (with CM being a nominal class marker).[1] *(L)a* obligatorily occurs in every intermediate C position between the extraction site and the final landing site, similarly to *aL*

[1] Abbreviations: AUX = auxiliary, CM = class marker, DEF = definite, DIST = distal, FUT = future tense marker, IMPERF = imperfective marker, INDEF = indefinite, NEUT = neutral, PERF = perfective marker, PRED.FOC = predicate focus, PROX = proximal, Q = question morpheme.

in Irish (McCloskey 2001, 2002). It also exhibits a subject/non-subject asymmetry, a type of the English *that*-trace effect (Perlmutter 1971) as in (1)-(2), surfacing as *a* in subject extraction and as *la* in non-subject extraction.[2]

(1) *Subject question with (l)a*
K-an **a** jox Musaa téere bi?
CM-Q C_{WH} hand Moussa book DEF.SG
"Who handed the book to Moussa."

(2) *Object question with (l)a*
K-an **l-a** Musaa gis?
CM-Q *l*-C_{WH} Moussa see
"Who did Moussa see?"

CM-*u* does not exhibit the subject/non-subject asymmetry, and in the Wolof dialect addressed in this paper it does not occur cyclically in long-distance extraction, but reflects agreement in φ-features (in the form of CM) with the covert *wh*-operator in its specifier (Torrence 2005, 2012a,b):

(3) *Subject question with* CM-*u*
K-u jox Musaa téeré bi?
CM-C_{WH} hand Moussa book DEF.SG
"Who handed the book to Moussa."

(4) *Object question with* CM-*u*
Y-u Musaa gis?
CM.PL-C_{WH} Moussa see
"What(pl) did Moussa see?"

The second crucial observation about Wolof is that the two versions of the complementizer are in complementary distribution in all but one construction (henceforth: *near-complementary distribution*): they can both occur in *wh*-questions, as in (1)-(2) and (3)-(4), but only one of the versions of C_{WH} is allowed in all other A′-constructions. For example, relative clauses are only formed with CM-*u*, and Exhaustive Identification (EI) constructions only with *(l)a*. The near-complementary distribution of the two versions of C_{WH} gives the impression that different syntax underlies the distinctions in their CP-layer, and this is in fact what all analyses thus far have assumed. The goal of this paper is to argue against this view, and 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 C_{WH} in Wolof has the same relevant featural content in all A′-movement constructions, meaning that all extraction effects—agreement in Wh- and φ-features and the subject/non-subject asymmetry—are present in the syntax of each of them. Their overt representation, however, is obscured by post-syntactic operations.

The analysis consists of two parts. First, I make a specific claim about the origin of all A′-extraction effects in Wolof: I propose them all to be reflexes of agreement between C_{WH} and

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

some element in the clause. This is an obvious analysis of the occurrence of the A′-movement complementizer in all C_{WH} positions between the extraction site and the final landing site and of the occurrence of φ-features of the extracted phrase on C_{WH} (signaling Agree between C_{WH} and the extracted phrase in the Wh-feature, and in φ-features, respectively). The subject/non-subject asymmetry is a more controversial type of effect, but I argue that, when its seemingly opaque surface syntax is analyzed as the morphological reflex of agreement, it feeds into the view of syntax as a simple, cross-linguistically uniform system. An analysis along these lines is proposed in Pesetsky and Torrego 2001 for the English *that*-trace effect. The crucial observation about this subject/non-subject asymmetry is that the A′-moved subject and the complementizer *that* are in complementary distribution in the CP-layer in English, just as the subject in Spec,CP and *l-* in C_{WH} are in complementary distribution in Wolof. For English, Pesetsky & Torrego take this to mean that the subject and *that* perform the same syntactic function – the checking of an uninterpretable feature on C. In their proposal, this can be accomplished either by the subject (in subject extraction), or by T-to-C movement (with T is realized as *that* in C in non-subject extraction). A direct prediction of this analysis is that C is morphologically more complex in non-subject extraction than in subject extraction, but in languages which Pesetsky & Torrego survey this complexity is not apparent on the surface, as C and T (when moved to C) are never both overt in A′-movement. In Wolof they are, therefore the analysis presented in this paper strenghtens their proposal and explains part of the surface complexity of the CP-layer as a result of the morphosyntax of agreement.

The second part of the analysis tackles the question of the distribution of CM-*u* and *(l)a* in different A′-structures by illustrating that the surface visibility of a particular A′-extraction effect (agreement in φ-features and the *a/la* asymmetry) correlates with the overtness of the φ-feature in the C head and its specifier. *Wh*-questions, the only A′-movement construction which can surface with either of the allomorphs of the complementizer, show us that the question with *(l)a* obligatorily has an overt question word in its specifier (CM-*an*), as in (1)-(2), while the question with CM-*u* obligatorily has a null specifier, seen in (3)-(4) (Torrence 2005, 2012a,b). Since both CM-*u* and the question word CM-*an* contain an overt φ-feature, their complementary distribution indicates that if an overt marker of a φ-feature shows up in C_{WH}, it does not show up in Spec,CP, and vice versa. In constructions with CM-*u*, in which the *wh*-word is never overt, this looks just like the the Doubly-Filled-Comp Filter (DFCF) effect (Chomsky and Lasnik 1977); in constructions with

(l)a, however, both C and Spec,CP are always overt, but C does not contain an overt φ-feature. The contribution of this paper is to provide a further step in the understanding of the DFCF, by grounding it in the grammar of feature cooccurrence. Namely, I argue the distribution of CM-*u* and *(l)a* to be a consequence of a morphological Obligatory Contour Principle (OCP) constraint, which prohibits the φ-feature from occupying 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. The Wolof data give support for a particular type of post-syntactic Impoverishment, called Obliteration, which does not delete only offending features, but targets entire nodes (e.g. in Arregi and Nevins 2007, 2012). The difference in surface forms of C (CM-*u* vs. *(l)a*) 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, *a* and -*u* are allomorphic realizations of C, crucially dependent on the presence or absence of φ (CM) in C. If either C or Spec,CP contain content unrecoverable in the CP-layer, the deletion of that element is blocked, which results in a particular construction always surfacing with only one allomorph of C. The distribution of the two variants of C is therefore a surface effect—the result of the OCP constraint and allomorphy—and not the product of underlying syntactic differences.

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. The OCP-type constraint is a typical post-syntactic principle 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 and their repairs are known to be language-, even dialect-specific (Arregi and Nevins 2012). The analysis I propose for the morphosyntax of Wolof A′-movement is therefore not meant to apply in this configuration in all languages. However, OCP-effects are expected to arise precisely in the type of rich agreement configurations as is the CP-layer in Wolof A′-movement. Wolof suggests that the DFCF might be due to post-syntactic cooccurrence restrictions, and not due to constraints in narrow syntax.

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. What it ultimately shows

is that careful examination of apparent syntactic irregularities in various languages must involve the cross-linguistic exploration of phenomena that occur in other modules of the grammar, and of their behavior at the interface with syntax. Even though some of these processes may appear to be unique to particular languages, by uncovering their uniform cross-linguistic properties, the apparent syntactic differences that they cause can be easily explained without endangering our view of syntax as a cross-linguistically uniform system.

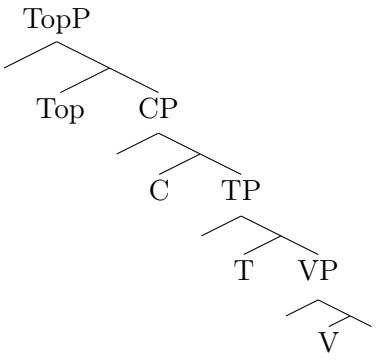
The paper is organized as follows. Section 2 lays out the relevant details of Wolof clause structure and §3 presents the syntax of A′-extraction and justifies a unified syntactic treatment of all A′-movement constructions in Wolof. The syntactic and the post-syntactic analyses of the morpho-syntax of A′-movement effects are 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 clausal 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 whether the subject is A′-moved or not) 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 (5).

(5) *Wolof clausal structure*



Wolof is an SVO language, as shown in the neutral affirmative sentence in (6):

(6) *Neutral sentence*
Xale yi jox na-ñu Musaa téeré bi.
child DEF.PL give C_{NEUT}-3PL Moussa book DEF.SG
"The children gave Moussa the book."

The basic word order is changed in A′-movement structures, such as Exhaustive Identification (EI) constructions, in which the EI-ed element is fronted:[3]

(7) *Object EI*
Téeré bi l-a xale yi jox Musaa.
book DEF.SG *l*-C_{WH} child DEF.PL give Moussa
"It's the book that the children gave to Moussa."

Aside from word order, (6) and (7) 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_{NEUT}), and *la* in the object focus sentence (glossed as C_{WH}). Second, the *subject marker* follows the particle *na* in (6) (*ñu*, 3PL), but is absent in (7).[4] I discuss the properties of complementizers and subject markers in the remainder of this section.

Sentential 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 morphology, and their temporal interpretation depends on context (Njie 1982). There are a number of different particles: the A′-extraction particle (traditionally considered subject/complement focus), imperative, affirmative, obligative and negative imperative/obligative particles, and four

[3] I translate Wolof EI constructions as English clefts, since this is the closest English meaning equivalent. It is important to keep in mind that Wolof EI structures are not syntactic clefts, as I extensively argue in §3.

[4] Another difference is the position of the verb. This is not relevant for the present purposes.

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 (Torrence 2005, 2012a; Dunigan 1994). Sentential particles are located in a projection which takes the TP as its complement, and are in complementary distribution. Dunigan (1994) therefore assumes that they all 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 (6), a 3PL subject marker *ñu* follows the sentential particle *na*, but it is altogether absent in (7). 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 neutral sentence in (6), and in complementary distribution with lexical subjects in others, as in the EI sentence in (7). Dunigan (1994) and Russell (2006) convincingly argue that subject markers are always pronouns, but that, when lexical subjects are at the left edge of the clause and subject markers follow the clausal particle, as in (6), the structure has an obligatorily left-dislocated (topicalized) lexical subject and a resumptive subject pronoun in Spec,TP. For the present purpose I adopt this analysis and consider subject markers to be pronominal elements.[5]

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 (8) and (9).

(8) *Subject marker and lexical subject in object EI*

a. Aali l-a **góor ñi** gis.
Ali *l*-C_{WH} man DEF.PL see
"It's Ali that the men saw."

b. Aali l-a-**ñu** gis.
Ali *l*-C_{WH}-3PL see
"It's Ali that they saw."

[5]For a detailed analysis of the difference between the two clause types—the one with obligatory pronominal subjects and the one without—see Author 2015.

(9) *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 by hypothesis A′-move to its specifier, as in (10) and (11).

(10) *Subject marker and lexical subject in subject EI*

a. **Aali**-a (>Aalee) gis xale bi.
Ali-C_{WH} see child DEF.SG
"It's Ali who saw the child."

b. **Mu**-a (>moo) gis xale bi.
3SG-C_{WH} see child DEF.SG
"It's her who saw the child."

(11) *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.[6] 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 sentential particles, Wolof also possesses a subordinating complementizer *ni* 'that', which can co-occur with sentential particles, in both non-extraction and extraction constructions, as in (12).

(12) *Subordinating complementizer* 'ni' *in Wolof*

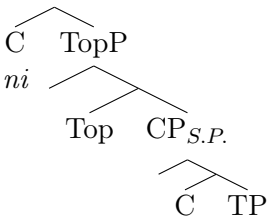
a. Gëm na-nũ **ni** Aali gis-na-∅ Musaa
believe C_{NEUT}-3PL that Ali see-C_{NEUT}-3SG Moussa
"They believe that Ali saw Moussa."

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?"

[6] All pronominal clitics in Wolof cluster together immediately to the right of C, preceding the lexical subject, if there is one. If the subject is a clitic, it is the initial element in the clitic cluster. The subject clitic and the lexical subject therefore do not appear to occupy the same surface position in the syntax. For different analyses of Wolof cliticization, see Dunigan 1994; Russell 2006; Author 2015.

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 route 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 sentential particles, as in (13).

(13) *Two CP layers in Wolof*



Subject markers and some allomorphs of C are clitics (Dunigan 1994; 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 3^{rd} person singular subject marker is $\emptyset$ when right-adjacent to *la*, as in (8b), and *mu* when right-adjacent to CM-*u*, as in (9b). Adjacent word-final vowel *i* and the C allomorph *a* become *ee*, shown in (10a), and adjacent *u* and *a* become *oo*, in (10b). 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 sentential 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 the

post-syntactic (§5) analysis of the CP-layer in A′-movement in Wolof.

3 A′-extraction in Wolof

Torrence (2005) shows that constructions with CM-*u* and those with *(l)a* both involve A′-movement.[7] Both forms signal agreement in the Wh-feature, and the use of one or the other allomorph correlates with the case of the extracted phrase (subject/non-subject asymmetry marking) and φ-agreement, respectively. At first glance, the distribution of the two forms of C_{WH} appears to be fairly simple: some A′-movement constructions occur only with *(l)a*, and some only with CM-*u*, suggesting that they are either syntactically or featurally distinct. In *wh*-questions both variants of C_{WH} can appear, which could mean that there are two syntactic strategies for forming questions, not uncommon in many languages. However, the structures with CM-*u* and those with *(l)a* show 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: questions with complex *wh*-phrases can only be formed with *(l)a*, regardless of the grammatical relation of the *wh*-phrase. I argue that the surface differences between structures with CM-*u* and those with *(l)a* result from constraints that determine whether the element in Spec,CP must be pronounced or not. In this section, I discuss the basic distribution of CM-*u* and *(l)a*, and offer empirical evidence in support of a unified syntax of the two constructions. In the remainder of the paper, I argue that the difference between CM-*u* and *(l)a* 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 – whether or not the phrase in Spec,CP is overt. I offer a post-syntactic analysis of the surface differences in the CP-layer in §5.

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 (14): it has an uninterpretable Wh-, T-, and φ-feature. I follow Pesetsky and Torrego (2001) in treating the EPP feature as a subfeature of features. In this case, all uninterpretable features have an EPP subfeature, meaning that they must be checked via Agree and Move.

[7] They are sensitive to islands, exhibit reconstruction effects, and pass a Wolof-specific A′-movement test where the applicative suffix *-al* is obligatory on the verb when an applied object undergoes A′-movement, and is impossible otherwise. For details, see Torrence 2005, 2012a.

(14) *Feature specification of C_{WH}*

$$\begin{array}{c} C_{WH} \\ \left[\begin{array}{c} u\mathrm{Wh}_{\mathrm{EPP}} \\ u\mathrm{T}_{\mathrm{EPP}} \\ u\varphi_{\mathrm{EPP}} \end{array}\right] \end{array}$$

C_{WH} occurs in a variety of sentence types: *wh*-questions, EI constructions, relative clauses, comparatives and copular sentences with two DPs (Double-DP copular sentences). Aside from *wh*-questions with a simple *wh*-word, which can contain either *(l)a* or CM-*u*, in all other structures the two allomorphs are in complementary distribution. Table 1 summarizes their distribution. In this paper, I discuss *wh*-questions, and a representative example from each of the two categories of structures (those that only allow for *(l)a*, and those that only allow for CM-*u*): EI constructions and relative clauses.[8]

		(l)a	CM-**u**
HIGHEST C	**wh-questions**	√	√
	Exhaustive Identification	√	*
	comparatives	√	*
	Double-DP copular clauses	√	*
	relative clauses	*	√
INTERMEDIATE C		√	*

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

Examples in (15) illustrate *wh*-questions with *(l)a*, preceded by an overt question word, CM-*an*. They also show the subject/non-subject asymmetry that this complementizer exhibits: it surfaces as *a* in subject extraction and as *la* in non-subject extraction.

(15) a. *Subject question with (l)a*
K-an **a** gis Musaa?
CM-Q C_{WH} see Moussa
"Who saw Moussa?"

b. *Object question with (l)a*
L-an **l-a** Musaa gis?
CM-Q *l*-C_{WH} Moussa see
"What did Moussa see?"

Questions completely equivalent in meaning to those in (15a) and (15b) can also be formed with the complementizer CM-*u*, as in (16a) and (16b) (see §3.2 for details on the semantic equivalence of the two structures). This variant of C does not exhibit a subject/non-subject asymmetry, but

[8]Other syntactic differences aside, EI constructions, comparatives and copular clauses all have the surface shape of the CP-layer in common: they all have an overt DP in Spec,CP. In EI structures it is the exhaustively identified constituent, in comparatives the DP which is the target of comparison, and in Double-DP copular sentences the predicate DP. Since there is no obvious unifying featural factor for these three structures, I argue in §5 that the fact that they all contain *(l)a* is the result of post-syntactic operations.

shows agreement in φ-features (in the form of noun class agreement) with a silent operator in its specifier (Torrence 2005, 2012a).[9]

(16) a. *Subject question with* CM-*u*

K-u gis Musaa?
CM-C_{WH} see Moussa
"Who saw Moussa?"

b. *Object question with* CM-*u*

L-u Musaa gis?
CM-C_{WH} Moussa see
"What did Moussa see?"

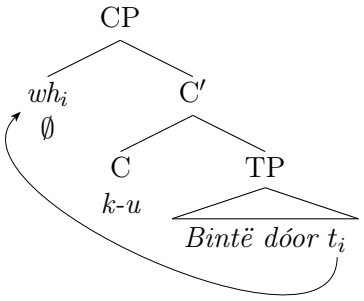
Wh-questions with CM-*u* can be posed about subjects, objects, locatives, manners, and instrumentals, as long as the question corresponds to one simple *wh*-phrase (*who, what, how*) (Torrence 2005, 2012b). The CM-*u* complementizer can be formed with any of the thirteen noun class markers, requiring 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 that selects for a null *wh*-phrase in its specifier, as in (17).

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

(17) a. K-u Bintë dóor?
CM-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*—in the literature treated differently, usually as a type of cleft (Kihm 1999; Torrence 2005, 2013a,b)—have the same syntax as those with CM-*u*. The purpose of the discussion

[9]Wolof is a noun class language, like other Atlantic languages, and class membership is usually indicated on DP elements other than the noun, such as articles and demonstratives (Torrence 2005, 2012a,b).

in this section is two-fold: to show that alternative explanations, which would attribute distinct syntax to the two structures, are not corroborated by the data, and to highlight the equivalent syntactic behavior of structures with CM-*u* and those with *(l)a*. The strongest argument ultimately comes from the main analysis presented in section 5, which shows that adopting the claim that CM-*u* and *(l)a* have the same syntax allows us to account for their distribution in different A′-movement constructions.

In the remainder of this section, I first addresses the semantic equivalence of the structures with CM-*u* and *(l)a*. This dismisses the possibility that CM-*u* and *(l)a* are syntactically distinct, in particular, that constructions with *(l)a* are clefts. Next, I discuss pied-piping data, which show that the *wh*-phrase can pied-pipe a preposition with both allomorphs, suggesting their syntactic equivalence, but that pied-piping of other material (which must be overt) is only possible with *(l)a*, pointing to the fact that the two structures differ in which material they allow to be overt in Spec,CP. And finally, data from long-distance extraction gives strong support for *(l)a* being an A′-movement complementizer, on a par with CM-*u*.

3.2 Semantic equivalence of CM-*u* and *(l)a*

At the beginning of this section, I have introduced the main claim of the paper – that CM-*u* and *(l)a* have the same relevant feature structure and are allomorphs of the same C_{WH}, and that the constructions in which they occur are syntactically identical. Before diving into the analysis which, when incorporating that assumption, succeeds in offering an explanation for the distribution of the two allomorphs, I shall present empirical evidence in support of this view, with the goal of showing that the predictions of some plausible alternative analyses are not supported by the data.

When a language has multiple syntactic strategies for forming ex-situ *wh*-questions, it is common for one of the resulting structures to be a cleft or a pseudocleft.[10] In fact, a common analysis in the literature is precisely that Wolof structures with *(l)a* are clefts (Kihm 1999; Torrence 2005, 2013a,b). I argue that the data do not support this analysis. In particular, *wh*-questions with *(l)a* do not exhibit properties of clefts. First, there are no semantic differences between structures

[10]Many Indo-European languages have cleft questions, English and French being among them. Austronesian languages, for example, have cleft- and pseudocleft-questions, in addition to *wh*-fronting (e.g. Potsdam 2009) and *wh*-in-situ. I am not aware of an ex-situ *wh*-question strategy aside from simple A′-movement that does not involve clefting or pseudoclefting.

with *(l)a* and those with CM-*u* in *wh*-questions, the construction in which they can both occur. Specifically, questions with *(l)a* are not associated with a non-cancelable existential presupposition, as is the case with clefts (Prince 1978). Second, all positions in which *(l)a* occurs cannot be associated with focusing/exhaustivity, also a hallmark of a cleft construction (Percus 1997; É. Kiss 1998). Third, there is no evidence to support a bi-clausal analysis of structures with *(l)a*, a crucial property of clefts. And finally, in *wh*-questions, there is no difference in the grammatical function of the constituents that are found in questions with CM-*u* and those in questions with *(l)a*, something we often do see in languages that employ multiple syntactic strategies for forming *wh*-questions. This last argument is a minor one, but is consistent with the overall view of the two constructions as being syntactically identical.

We begin by comparing the semantic properties of structures with *(l)a* to those of clefts in French and English. It was already mentioned in §3.1 that speakers make no interpretative difference between the two types of questions (this is also noted in Torrence 2005, and Torrence's subsequent work). As a point of comparison, consider the difference between French cleft-questions and in-situ questions. Clefts are associated with an existential presupposition, seen from the infelicity of the question-answer pair in (18). Namely, the cleft question carries a non-cancelable existential presupposition that there exists something that the person does in life, and since *nothing* cancels such a presupposition, it is not a felicitous answer to (18a). The in-situ strategy, in (19), does not exhibit the same effect – the existential presupposition can easily be canceled (Shlonsky 2012, 248):

(18) *Cleft question in French*

a. C'est quoi que tu fais dans la vie?
it's what that you do in the life
"What is it that you do in life?"

b. #Rien.
"Nothing."

(19) *In-situ question in French*

a. Tu fais quoi dans la vie?
you do what in the life
"What do you do in life?"

b. Rien.
"Nothing"

In Wolof, neither the question with *(l)a* nor the question with CM-*u* are associated with a non-

cancelable existential presupposition; both (20a) and (21a) can felicitously be answered with *"Nothing"*:

(20) *Wh-question with* (l)a

a. L-an **l-a** Musaa gis?
CM-Q C_{WH} Musa see
"What did Moussa see?"

b. Dara.
"Nothing."

(21) *Wh-question with* CM-u

a. **L-u** Musaa gis?
CM-C_{WH} Moussa see
"What did Moussa see?"

b. Dara.
"Nothing."

Similarly, in the English cleft question in (22) the existential presupposition (that there exists someone that Moussa saw) cannot be canceled, making the insertion of a presupposition suspender (Horn 1972), such as *if anyone*, infelicitous. In a non-cleft *wh*-question in (23) this effect is not observed:

(22) *Cleft wh-question in English*

a. Who was it that Moussa saw?

b. #Who was it, if anyone, that Moussa saw?

(23) *Non-cleft wh-question in English*

a. Who did Moussa see?

b. Who, if anyone, did Moussa see?

In Wolof, the existential presupposition can be canceled via insertion of *if anyone* both in questions with *(l)a* and in those with CM-*u*:

(24) *Canceling the existential presupposition in* la-*question*

a. K-an l-a Musaa gis?
CM-Q *l*-C_{WH} Moussa see
"Who did Moussa see?"

b. K-an, s-u di-ee (>dee) am na-∅ kenn, l-a Musaa gis?
CM-Q CM-C IMPF-*ee* have C_{NEUT}-3SG someone, *l*-C_{WH} Moussa see
"Who, if anyone, did Moussa see?"

(25) *Canceling the existential presupposition in* CM-u-*question*

a. K-u Musaa gis?
CM-C_{WH} Moussa see
"Who did Moussa see?"

b. S-u di-ee (>dee) am na-∅ kenn, k-u Musaa gis?
CM-C IMPF-*ee* have C_{AFF}-3SG someone, CM-C_{WH} Moussa see

"If anyone, who did Moussa see?"

Semantic differences between structures with CM-*u* and *(l)a*, that we would expect to see if one of the constructions was a cleft, are not found in Wolof.

Another property of cleft constructions is Exhaustive Identification of the clefted constituent (Percus 1997; É. Kiss 1998). Some A′-movement constructions with *(l)a* are indeed associated with EI. It has therefore been claimed in the literature that *(l)a* is a focus marker (Dunigan 1994; Russell 2006). The syntactic parallel between EI constructions and questions is not uncommon. It has been observed that languages which have a designated EI position tend to move their *wh*-phrases to that position as well, as is the case in Hungarian (Horvath 1986; É. Kiss 1998), and comparatives, which obligatorily contain *(l)a*, are also claimed to involve focusing (Reglero, 2006; Merchant, 2009). 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/exhaustivity feature associated with it, triggering A′-movement of the EI-ed constituent to its specifier, and that CM-*u* is the *elsewhere* A′-movement complementizer. However, *(l)a* occurs in environments which cannot be straightforwardly argued to involve EI/focusing.[11] First, it obligatorily occurrs in every intermediate C between the extraction and the final landing site, as we shall see in the following section, which makes it difficult to argue that every C along the path of A′-movement has an EI/focus feature, or, for that matter, that the only way to A′-extract a constituent out of any clause-type is to focus/exhaustify it.[12] Second, *(l)a* occurs in a structure which is not obviously related to EI/focus: copular sentences with nominal predicates. In an information-structurally neutral[13] predicational copular sentence, the nominal predicate is located in the specifier of *(l)a*, as in (26):

(26) *Copular sentence with a nominal predicate in Wolof*
Ndongo **l-a**-ñu.
student *l*-C_{WH}-3PL
"*They are students.*"

I do not discuss copular clauses in this paper, because their syntax is more complex (see Author 2015a, b, to appear), but the presence of *(l)a* in such a structure is an argument against an analysis

[11] This is not to say that C_{WH} could not have additional features, some type of a focus feature amongst them. The claim I am making is that the presence of any additional features on C_{WH} is not what determines the distribution of the two allomorphs. In other words, *(l)a* is not the spell-out of a head which always carries a focus feature.

[12] But see Torrence (2013b) on a proposal for successive-cyclic clefting in Wolof.

[13] By *information-structurally neutral*, I mean an out-of-the-blue or a broad sentence focus context.

that would rely on its EI/focusing function.

Another crucial property of clefts is bi-clausality. Evidence of bi-clausality includes a copular verb in the higher clause, an expletive subject, and relativizers/complementizers which usually occur in relative clauses in the language.[14] Wolof does not have one verb that would be the equivalent of the English *be*, nor an overt expletive, making the search for evidence of bi-clausality more difficult. It does, as we have seen, have a complementizer that is always overt in relative clauses. The complementizer usually occurring in relative clauses, CM-*u*, does not occur in structures with *(l)a*, something we might expect if they were indeed clefts, containing a relative clause:

(27) *Relative clause*
nit k-u Musaa gis
person CM-C_{WH} Moussa see
"A person who Moussa saw."

(28) *(L)a question*
K-an l-a (*k-u) Musaa gis?
CM-Q *l*-C_{WH} (*CM-C_{WH}) Moussa gis
"Who did Moussa see?"

Another possibility is that structures with *(l)a* are pseudoclefts, sentences consisting of a free relative and a DP, connected with a copula. Wolof, however, does have pseudocleft constructions, as in (29):

(29) *Pseudoclefts in Wolof*
Ñ-i lekk tangal yi xale yi l-a.
CM-C eat sweets DEF.PL child DEF.PL *l*-C_{WH}
"Who ate the sweets were the children."

The sentence in (29) shows that a pseudocleft in Wolof contains an overt complementizer in the free relative (*ñi*). No such element occurs in A′-movement constructions with *(l)a*.

A final, minor argument that structures with CM-*u* and *(l)a* are not two distinct strategies for forming *wh*-questions comes from comparing Wolof with languages which do have multiple strategies. Crucially, those strategies often differ in some way. For example, different strategies might be used for questioning different constituents, as is the case in some Austronesian languages. Seediq (Aldridge 2002, 2004) uses clefts or *wh*-in-situ for argument *wh*-questions, but only *wh*-in-situ for adjunct *wh*-questions. Tagalog (Richards 1998; Aldridge 2002, 2004) uses clefts for argument *wh*-questions, but focus fronting for adjunct *wh*-questions. There is no such division of labor in Wolof: constituents of any grammatical function can be questioned both in a structure with CM-*u* and *(l)a*. The only restriction is in what can/must be pronounced in Spec,CP, which receives a

[14]See, for example, Potsdam (2009) and Potsdam and Polinsky (2011) for tests of bi-clausality of A′-movement constructions in Austronesian languages.

straightforward explanation in the post-syntactic analysis I propose in §5.

To summarize: in order to claim that Wolof A′-movement constructions with *(l)a* which are the topic of this paper are clefts or pseudoclefts, one would have to posit a special type of a relative clause without an overt C that occurs only in clefts, or another type of a pseudocleft, in addition to the one in (29), in which a free relative does not have an overt C. More importantly, one would have to explain the absence of semantic differences between structures with CM-*u* and those with *(l)a*, which are expected if one of those structures is a cleft. Finally, and most importantly, given the absence of semantic differences, positing syntactic differences offers no insight into the distribution of the two structures.

3.3 Syntactic equivalence of CM-*u* and *(l)a*

In the previous section, I discussed the lack of evidence for a semantic difference between structures with CM-*u* and those with *(l)a*, which we would expect to find if one of the two structures was a syntactic cleft, or related to an exhaustivity/focus feature, as argued in previous work on Wolof. In this section, I present empirical arguments in favor of uniform syntactic treatment of structures with the two allomorphs.

An important 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 sentential particle is not possible (Dunigan 1994). The example in (30b) illustrates an attempt at extraction out of an embedded clause with the predicate 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).

(30) *V/VP-focus particle and A′-extraction*

a. Moodu xam ni Faatu **dafa** gis gaynde.
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 **dafa** 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 C in an embedded relative clause; only *(l)a* is allowed:

(31) Relative Clauses

a. film b-u ñu bëgg
movie CM-C_{WH} 1PL like
"a movie we liked."

b. *film b-u mu wax-oon ni b-u ñu bëgg
movie CM-C_{WH} 3SG say-PERF that CM-C_{WH} 1PL like

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

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

Torrence (2005, 2012a,b) presents data which show that for some speakers the complementizer CM-*u* exhibits the same behavior, i.e. that it occupies intermediate C positions in long-distance extraction, shown in (32a). 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 (32b) (example from Torrence 2012b, p.1173):

(32) CM-u *in intermediate positions in long-distance extraction*

a. **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 IMPF hit
"Who did Kumba say that Isa thought that Maryam will hit?"

b. **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 IMPF hit
"Who did Kumba say that Isa thought that Maryam will hit?"

For all my native speaker consultants, CM-*u* in intermediate C_{WH} positions is ungrammatical. However, taking Torrence's data into account may give support to my proposal to treat *(l)a* and CM-*u* as allomorphs of C_{WH}, since they show that both variants can occupy C_{WH} in long-distance extraction, and even alternate along the path of extraction. The analysis I propose in §5 accounts

for both dialects – the one described in this paper, in which only *(l)a* can occupy intermediate C positions in long-distance extraction, and Torrence's dialects, in which either can occur in any intermediate C.

Another important piece of evidence for the parallel treatment of CM-*u* and *(l)a* comes from pied piping. First, not all phonologically overt material is banned from Spec,CP of structures with the allomorph CM-*u*. The locative preposition *ci* can be pied-piped by the *wh*-phrase both in constructions with CM-*u* and in those with *(l)a* (Torrence 2012a):[15]

(33) *Preposition pied-piping in Wolof*[16]

a. {Ci fan}/{Fan ci} la-ñu teg téeré 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 téeré bi?
P-LOC CM-C$_{WH}$-3PL put book DEF.SG
"On what did they put the book?"

These examples show that both the overt *wh*-phrase in (33a) and the null *wh*-phrase in (33b) can pied-pipe material to Spec,CP. Crucial for us is that not all material can be pied-piped with both C$_{WH}$ allomorphs, and the restriction parallels the distribution of CM-*u* and *(l)a* in all other constructions in Wolof. Namely, CM-*u* is found only in constructions with null *wh*-words in Spec,CP, and *(l)a* in constructions with overt DPs in Spec,CP. This extends to questions with complex *wh*-phrases, which can only be formed with the complementizer *(l)a*, as shown in (34). CM-*u* is banned.[17]

(34) *Questions with a complex* wh-*phrase can only contain* (l)a

a. Yaay-u **k-an l-a** Aali gis?
mother-of CM-Q *l*-C$_{WH}$ Ali see
"Whose mother did Ali see?"

b. *Yaay-u **k-u** Aali gis?
mother-of CM-C$_{WH}$ Ali see

c. **B-an** xale **l-a** Faatu gis?
CM-Q child *l*-C$_{WH}$ Fatou see

[15]This is the only preposition that behaves in this way in Wolof. Other prepositional elements, *ag* 'with' (which is also a conjunction) and *ngir* 'for' cannot pied-pipe or be stranded in A′-movement, but are replaced with applicative/benefactive suffixes on the verb (Torrence 2012a).

[16]In *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.

[17]Torrence (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 my 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.

"Which child did Fatou see?"

d. ***B-an*** xale ***b-u*** Faatu gis?
CM-Q child CM-C_{WH} Fatou see

The data in (33) and (34) bring home the point that the crucial distinction between CM-*u* and *(l)a* lies in the content of Spec,CP. When the phrase in Spec,CP is recoverable (as I shall argue in §5 that *wh*-words are), it can be null and the complementizer may surface as CM-*u*. When the phrase is Spec,CP is not recoverable (as, for example, complex *wh*-phrases which contain non-operator material), it must be overt, which correlates with the allomorph *(l)a*. The availability of preposition pied-piping with both allomorphs lets us know that it is the type of DP that makes complex *wh*-questions ungrammatical with CM-*u*, and not just any kind of overt material in Spec,CP. I argue in §5 that the reason for the ungrammaticality of complex *wh*-phrases with CM-*u* lies in the tension between the requirement that the phrase in Spec,CP containing φ-features must be deleted when C is realized as CM-*u*, and the fact that complex *wh*-phrases cannot be deleted (due to their non-recoverability). Such questions can therefore only contain *(l)a*. If we assume that structures with CM-*u* and *(l)a* are syntactically equivalent, and their surface differences the result of post-syntactic processes, we have a way of understanding the pied-piping facts, which otherwise remain unexplained.

3.4 Summary

In this section, I have presented arguments for treating *(l)a* as an A′-movement complementizer, on a par with CM-*u*. I have demonstrated the lack of semantic differences between the two structures, and the lack of syntactic evidence for a cleft or a pseudocleft analysis in Wolof, weakening the alternative analyses which treat structures with *(l)a* as syntactically distinct. I also showed that *(l)a* behaves like an A′-extraction complementizer *par excellence*: it obligatorily occupies all intermediate C positions along the movement path in long-distance extraction. The fact that certain dialects also allow the occurrence of CM-*u* in intermediate Cs strengthens the proposal that they are allomorphs of the same complementizer. Both complementizer variants occur in A′-movement constructions. In one type, *wh*-questions, both versions are possible, with no difference in meaning or contexts of use. In other structures only one is allowed, which correlates with the overtness of the *wh*-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*.

Adopting the proposal that CM-*u* and *(l)a* are allomorphs, we are left with two puzzles to solve. First, why is it that with the complementizer CM-*u*, which exhibits φ-agreement, we never see the subject/non-subject asymmetry, and vice versa, why is there no φ-agreement on C_{WH} with *(l)a*? Second, what mechanisms determine which allomorph of C_{WH} is observed in which context, i.e. why can C_{WH} 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, EI 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, which explains the distribution of *a* vs. *la* in structures with this complementizer. This lays the groundwork for the exploration of the interaction of syntax and post-syntax in §5.

4 Agreement in C and the *a/la* Asymmetry

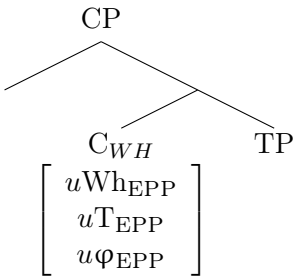
In section 3 I argued that all A′-movement constructions share the same syntax. The goal of this section is to elucidate one part of that syntax – the subject/non-subject asymmetry, in which C_{WH} surfaces as *a* in subject extraction, and as *la* in non-subject extraction. I argue that the syntactic processes behind the asymmetry exhibited by the allomorph *(l)a* can be reduced to agreement between C_{WH} and other elements of the clause, just as the variation in the initial consonant of the allomorph CM-*u* reflects agreement between C_{WH} and the extracted phrase. The other part of the surface differences between the two allomorphs, which in particular environments obscures some of the agreement effects, comes from post-syntactic processes discussed in §5.

The important contribution of the analysis presented in this section is its treatment of the subject/non-subject asymmetry in Wolof as the result of agreement, building on a proposal by Pe-

setsky and Torrego (2001) (henceforth P&T) who thus analyze the English *that*-trace effect. Wolof is an especially nice example which corroborates an important prediction made by P&T's analysis, which is that C is more morphologically complex in non-subject extraction than in subject extraction. Furthermore, this analysis unifies both A′-extraction effects in Wolof—the *a/la* asymmetry and the φ-feature agreement in C—in assigning them the same trigger: the valuation of C's features.

My proposal claims that every C_{WH} has at least some of the same features, in particular those specified in (35), and that only those features are relevant in the pronunciation of the complementizer in the two structure types.

(35) *Feature Specification of C_{WH} in Wolof*



The complementizer's uninterpretable features must be checked via Agree and 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 agreement between C_{WH} and the extracted phrase in φ-features, which is displayed as a class marker on the complementizer allomorph CM-*u*:

(36) a. *Subject question with* CM-*u*
K-u gis Musaa?
CM-C_{WH} see Moussa
"Who saw Moussa?"

b. *Object question with* CM-*u*
L-u Musaa gis?
CM-C_{WH} Moussa see
"What did Moussa see?"

This type of agreement occurs long-distance; in (37), 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 (32a)-(32b)).

(37) *Long-distance extraction with* CM-*u in final landing position*
K-u ñu gëm ni l-a Musaa xalaat ni l-a Aali gis?
CM-C_{WH} 1PL believe that *l*-C_{WH} Moussa think that *l*-C_{WH} Ali see
"*Who do we believe that Moussa thinks that Ali saw?*"

(37) also contains the second variant of C_{WH}, *(l)a*, occurring in intermediate C_{WH} positions. 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 (38a), and as *la* in non-subject extraction, in (38b). The asymmetry is local: as can be seen from (39), it only occurs at the bottom of the dependency, on the C_{WH} local to the extraction site.

(38) a. *Subject EI with* (l)a
Aali **a** (>Aalee) gis Musaa
Ali C_{WH} see Moussa
"It's Ali that saw Moussa."

b. *Non-subject EI with* (l)a
Musaa **l-a** Aali gis
Moussa *l*-C_{WH} ali see
"It's Moussa that Ali saw.".

(39) *Long-distance extraction with* (l)a
Aali **l-a**-a gëm ni **l-a** Musaa xalaat ni mu-**a** (>moo) leen gis.
Ali *l*-C_{WH}-1SG believe that *l*-C_{WH} Moussa think that 3SG-C_{WH} 3PL.OBJ see
"It's Ali that I believe that Moussa thinks that saw them."

That the occurrence of φ-features of the extracted phrase on C_{WH} is the result of agreement is by no means a controversial claim. This section however argues that the subject/non-subject asymmetry is also an agreement-based phenomenon. In particular, I follow P&T and analyze the *a/la*-asymmetry as a T-C asymmetry, which is the result of an uninterpretable T feature on C that can be checked either via subject movement or via T-to-C movement. In §4.1, I give an overview of P&T's system, and in §4.2 I argue that the Wolof facts provide direct evidence for this type of an analysis of *that*-trace-effect-like subject/non-subject asymmetries.

4.1 Pesetsky & Torrego (2001)

P&T's unified analysis of the T-to-C asymmetry and the *that*-trace effect in English rests on two hypotheses: (i) T-to-C movement is motivated by an uninterpretable T feature (*u*T), with an EPP subfeature, on C, and (ii) Nominative case is *u*T on D. The first hypothesis has to do with the principle in (40), which states that only the closest instance of anything can be attracted.

(40) ATTRACT CLOSEST (Chomsky 1995): only the closest constituent can be attracted.

This means that, in any instance of movement to Spec,CP, C has to have a *u*T, which would attract the closest constituent.[18] P&T propose this to be a general property of C heads, which is what

[18] Under this proposal, elements which are farther away can only move once the closest element has moved, following the Principle of Minimal Compliance (Richards 1997).

will ultimately account for the *that*-trace effect. The second hypothesis, concerning the nature of nominative case, is what is responsible for the special status of subjects, and allows P&T to unify T-to-C movement and the movement of the subject to Spec,CP as doing the same job.[19]

The next relevant principle determines how movement from the closest constituent proceeds. Namely, it must be explained why, if C attracts the closest constituent, the TP, it is not the entire TP that moves, but only its head. P&T stipulate the Head Movement Generalization in (41):[20]

(41) Head Movement Generalization (HMG): the movement from a complement to the nearest head is always realized as head movement.

And finally, the Economy Condition in (42) is crucial in ensuring that either subject movement or T-to-C movement take place.

(42) Economy Condition: A head H triggers the minimum number of operations necessary to satisfy the properties (including EPP) of its uninterpretable features.

The key data for P&T's analysis are the examples in (43), illustrating the T-to-C asymmetry. In English matrix questions, in addition to *wh*-movement to Spec,CP, subject-auxiliary inversion also takes place, standardly analyzed as T-to-C movement. However, this only occurs in non-subject extraction, as in (43a)-(43b); in subject extraction, in (43c)-(43d), no T-to-C takes place.

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

a. What did Mary buy?

b. *What Mary bought?

c. *Who did buy the book? (unless *did* is focused)

d. Who bought the book?

[19] P&T argue that, though novel, this is not as radical as it may seem: "We are used to the idea that T (and its projections) bears features that are uninterpretable on it but would be interpretable were they found on D (e.g. person and number). Hypothesis (8) [i.e. that nominative case is *u*T on D] is simply the proposal that the reverse is also true. D and its projections bear features that are uninterpretable on it but would be interpretable were they found on T. We call the features proper to D "agreement" when borne by T, and we call the features proper to T "nominative" when borne by D." (p.364)

[20] P&T propose that (41) arises due to the fact the C's complement, TP, already merged with it once. Were it to move again, it would be in effect be merging with the same head twice. They suggest that, in such a case, only the head of the complement moves.

The T-to-C asymmetry in (43) is schematized in (44) (the schema shows the structures before T-to-C has taken place). C has *u*T and *u*Wh, the subject has *u*T (i.e. unchecked nominative case), and the *wh*-phrase (the object, in (44a), or the subject, in (44b)) has *i*Wh. T, of course, has *i*T.

(44) a. $[_{C}$ *u*T, *u*Wh$]$ $[_{TP}$ [Mary, *u*T] T $[_{VP}$ bought what]] (43a)-(43b)

b. $[_{C}$ *u*T, *u*Wh$]$ $[_{TP}$ [who, *u*T] T $[_{VP}$ bought the book]] (43c)-(43d)

In (44), the nominative subject is already attracted to Spec,TP by T's need to check its uninterpretable φ-features. *u*T on the subject is checked by *i*T, and marked for deletion; however, a checked uninterpretable feature remains undeleted until the end of the phase which it is in (here the CP cycle), and is accessible to further operations. P&T explain the lack of T-to-C movement in subject extraction (43d), and its occurrence in object extraction (43a) in the following way. C bears *u*Wh and *u*T, with an EPP feature. In non-subject extraction in (44a), the closest element that bears a Wh-feature is *what*, but both the nominative subject and T (which respectively carry a checked *u*T/*i*T) are closer to C than *what*. Due to Attract Closest the TP is attracted, which results in head movement of T to C, as a result of the HMG.[21] Only then can the object A′-move to delete C's *u*Wh. C is thus forced to delete its uninterpretable features in two separate operations. The result is that both the *wh*-phrase and T are attracted by C in non-subject extraction.

[21] If C has the option of deleting its *u*T either by attracting the subject or by attracting the TP, the question arises why this is not possible in object extraction in matrix questions, i.e., why both (44a) and (44b) are not well-formed:

(i) *Matrix object questions*

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

P&T claim that this is in fact a possibility, but that in English this happens to have consequences on interpretation. According to their analysis, if a C with *u*Wh has a non-*wh*-phrase as a specifier, the clause is interpreted as an exclamative. This is illustrated by examples that support exclamative interpretation, as in 21:

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

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

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

(iii) *Nominative subject as the exclamative phrase*

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

Turning to subject extraction in (44b), TP and its nominative specifier both count as the closest constituent to C, so, in principle, C can choose to delete *u*T by attracting the TP (realized as head movement), or by attracting its specifier. If it attracts TP (realized as T-to-C), it deletes just one of its two uninterpretable features. If, on the other hand, it attracts the nominative phrase, both *u*T and *u*Wh can be deleted in one step, since the phrase in Spec,TP has both features. The Economy Condition prevents unnecessary movement from taking place, and bans the derivation in which T-to-C takes place in subject extraction.

P&T extend this analysis to account for the *that*-trace effect in English, illustrated in (45), in which the occurrence of the complementizer *that* is banned in subject extraction from an embedded clause (b), whereas this is not the case in non-subject extraction (c). The *that*-trace effect is similar to the T-to-C asymmetry in that in both cases subject extraction prevents a word from occurring in C, that is found there when non-subjects are extracted. To account for the effects in (45), P&T claim that *that* is not C, as is usually assumed, but an instance of T that has moved to C.

(45) *The* that-*trace effect in English*

a. Who did John say will buy the book?

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

c. What did John say (that) Mary will buy?

The reason why (45b) is not possible is the same one that prevents T-to-C in sentences like (43c): the nominative *wh*-phrase deletes both *u*T and *u*Wh on C, as in (46a). If T were to move as well, as in (46b), it would violate the Economy Principle, since *u*T can already be checked by the subject.

(46) a. Who$_i$ did John say [$_{CP}$ *t*-[*who, iWh, uT*]$_i$ [C, ~~*u*T~~, ~~*u*Wh~~] [$_{IP}$ *t*-who$_i$ will$_j$ buy the book]]?

b. *Who$_i$ did John say [$_{CP}$ *t*-[*who, iWh, uT*]$_i$ [$_T$ that]$_j$+[C, ~~*u*T~~, ~~*u*Wh~~] [$_{IP}$ *t*-who$_i$ will$_j$ buy the book]]?

It follows that when the extracted element is not the subject, *that* should be optional, since in those cases, both TP and its specifier (the subject) bear a *u*T feature, and both are equally close to C. This is precisely what we see in long distance object extraction:

(47) *Long distance object extraction in English*

What did Sue say [$_{CP}$ (that) Mary will buy]?

With the sketch of Pesetsky and Torrego's analysis in mind, let us now turn to Wolof and see how it can account for the subject/non-subject asymmetry in Wolof *(l)a*-constructions. As promised, we shall see that the *a/la* asymmetry in Wolof confirms an important prediction of P&T's analysis: that C is morphologically more complex in non-subject than in subject extraction.

4.2 The Subject/Non-subject Asymmetry in Wolof

As in English, C_{WH} in non-subject extraction in Wolof contains an element that is absent in subject extraction. In English, this is *that*, in Wolof the element *l-* which precedes the complementizer *a*. Since C_{WH} is always overt in Wolof, the effect is present in matrix questions as well. The relevant data are repeated in (48).

(48) a. *Subject EI with* (l)a

Aali **a** (>Aalee) gis Musaa
Ali C_{WH} see Moussa
"It's Ali that saw Moussa."

b. *Non-subject EI with* (l)a

Musaa **l-a** Aali gis
Moussa *l*-C_{WH} Ali see
"It's Moussa that Ali saw."

The key to my proposal is that *l-* is an instance of T which has moved to C_{WH}, just as for P&T *that* is an instance of T in C. In subject extraction, *l-* is absent because the moved subject performs the same function as *l-* – it checks *u*T on C, by virtue of carrying a checked *u*T feature, i.e. nominative case. In the following paragraphs, I illustrate the derivations of subject and non-subject A′-extraction in Wolof.

The subject extraction sentence in (49a) has the structure in (49b), before the movement of the EI-ed phrase:

(49) *Subject extraction*

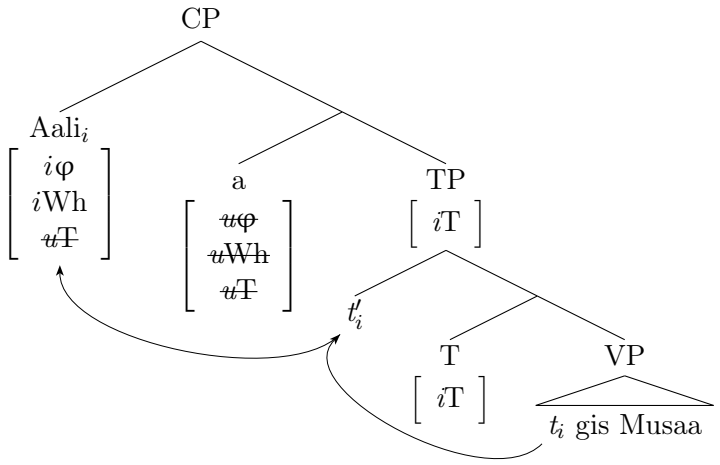
a. Aali **a** (>Aalee) gis Musaa.
Ali C_{WH} see Moussa
"*It's Ali that saw Moussa.*"

b. [$_{C}$ a$_{uT,uWh,u\varphi}$] [$_{TP}$ Aali$_{uT,iWh,i\varphi}$ *i*T [$_{VP}$ gis Musaa]]

The subject in (49b) is already attracted to Spec,TP by T's need to check its uninterpretable φ-

features, and uT on the subject is also checked through agreement with T and marked for deletion; however, it may remain undeleted until the end of the CP cycle, and be accessible to further operations. The derivation with subject extraction is illustrated in (50). C_{WH} bears uWh and uT, with an EPP feature. TP and its nominative specifier both count as the closest constituent to C, but since the nominative phrase already must move to Spec,CP for $u\varphi$ and uWh, uT can also be checked. The Economy Condition prevents unnecessary movement to take place, and bans T-to-C. As a result, no *l-* surfaces in C.

(50) *Subject extraction as uT valuation*



On the other hand, if a non-subject is A′-extracted, as in (51), it has only iWh and $i\varphi$, meaning that another element must check C's uT. The structure after C has merged with TP is shown in (51b).

(51) *Object extraction*

a. Musaa **l-a** Aali gis
Moussa *l*-C_{WH} Ali see
"*It's Moussa that Ali saw.*"

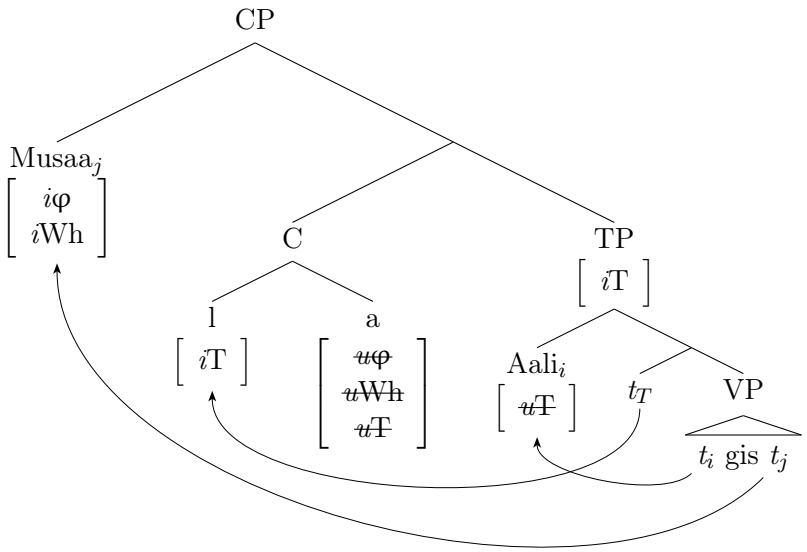
b. [$_{\text{C}}$ a$_{uT,uWh,u\varphi}$] [$_{\text{TP}}$ Aali$_{uT}$ iT [$_{\text{VP}}$ gis Musaa$_{iWh,i\varphi}$]]

The closest constituent that can value one of C's uninterpretable features is the TP or its specifier. Due to the fact that the closest constituent must move (Attract Closest), either T or the subject from Spec,TP would have to move to check uT. In Wolof, the only option is to attract the TP,[22] which according to the Head Movement Generalization is realized as Head Movement of T to C.

[22] I argue the reason for this to be that Wolof only allows for one specifier position. I return to this point shortly.

This does not value *u*Wh or *i*φ on C, which can only be deleted by attracting the object DP.[23] Therefore, C needs two movement operations to delete all of its uninterpretable features. The key to this proposal is the assumption that *l-* is the spell-out of T that has moved to C, as shown in (52).[24]

(52) *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 *u*T on C_{Wh}, due to the fact that it carries nominative case. Seeing how C_{Wh} in local subject extraction differs from C_{WH} 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_{WH} in sentences like (51) cannot choose between Spec,TP and TP (i.e. its head), to delete *u*T. In other words, why is the sentence in (53) not a possible way to focus an object?

[23] The subject could also value *i*φ, however, the object with *i*Wh could then no longer move to Spec,CP, again, due to the fact that Wolof's C only has one specifier position.

[24] A reviewer points out that, for example, the perfective morpheme *(w)oon* can occur below C in the clause in which T-to-C movement presumably takes place. There is, however, no reason to believe that *(w)oon* occupies T, and not some lower projection (e.g. Aspect; see Author 2015 for a proposal along these lines). Furthermore, this analysis assumes that *l-* is the Spell-Out of T in C, and not of T in T. Even if *(w)oon* was generated in T, one feature could 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 also similar to analyses of resumption in languages where the resumptive pronoun behaves as a phonetically realized trace of movement (Engdahl 1985; Demirdache 1991).

(53) *Subject movement to Spec,CP in object extraction*

*Musaa Aali **a** (<Aalee) gis
Moussa Ali C_{WH} see
intended:"*It's Moussa that Ali saw.*"

From the ungrammaticality of (53), the following appears to be true of the C_{WH} in Wolof: (i) the phrase carrying the *Wh*-feature must occupy the specifier of C_{WH}, and (ii) C_{WH} has only one specifier position.[25] 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.[26]

Aside from confirming the predictions of P&T's analysis concerning the greater morphological complexity of C in non-subject extraction, Wolof provides additional support for their proposal. In the languages that they discuss (Standard English, Belfast English, Spanish), C is always phonologically null, and only T is overt. If my analysis is on the right track, the evidence for a T-to-C analysis of the *that*-trace effect is strengthened by providing evidence from a language in which both T and C are overt.

Let us now turn to long distance A′-movement in Wolof, which is interesting for two reasons. First, *(l)a* occurs in C of each embedded clause, which is straightforwardly explained by adopting the now fairly standard assumption that long-distance A′-movement consistes of a series of smaller steps. If *(l)a* is the spell-out of a complementizer that carries a Wh-feature, its presence in C_{WH} of every embedded clause is necessary for the A′-moved element to be fronted to the beginning of the sentence. Wolof, therefore, as Irish, gives direct support for the cyclic nature of A′-movement. Second, as in the *that*-trace effect, the subject/non-subject asymmetry is local, occurring only in the most embedded clause. Under the assumption that a checked uT on the subject can only participate in operations within the phase in which it originates (the most embedded CP), subsequently being obligatorily deleted, P&T's prediction that T-to-C occurs in each higher clause is again confirmed in Wolof.

The example in (54) illustrates the extraction of an embedded EI-ed subject.

[25] This involves an implicit claim that the number of EPP subfeatures (here all the relevant features have an EPP subfeature) does not necessarily correspond to the number of specifier positions. At this point, this is only a stipulation which needs to be further tested.

[26] Recall that P&T claim this is a possible derivation in English, with consequences for interpretation in matrix clauses (being felicitous only in structures that support an exclamative interpretation), and resulting in the optionality of *that* in embedded clauses in non-subject extraction.

(54) *Long-distance subject extraction*

a. Aali **l-a**-a gëm ni **l-a** Musaa xalaat ni mu-**a** leen gis
ali *l*-C_{WH}-1SG believe that *l*-C_{WH} Moussa think that 3SG.SBJ-C_{WH} 3PL.OBJ see
"*It's Ali who I believe that Moussa thinks saw them.*"

b. $[_{CP}$ [$Aali_{iWh}$]$_i$ l_{iT} $a_{uT,uWh}$ a t_T gëm ni

$[_{CP}$ t_i' l_{iT} $a_{uT,uWh}$ Musaa t_T xalaat ni $[_{CP}$ mu_i $a_{uT,uWh}$ t_i leen gis]]]

In (54), the subject first moves from inside the VP to Spec,TP, to check $u\varphi$ on T. At the same time, uT on the subject is checked and marked for deletion via Agree with T. Next, the subject moves from Spec,TP to Spec,CP in order to check both uT and uWh on C_{WH}. uT on the subject now has to be deleted, since the phase has ended. The C_{WH} of the next higher clause needs to delete its uT and uWh. The closest constituent that it can attract to delete uT is the TP, resulting in T-to-C (per the HMG), which surfaces as *l-* preceding *a*.[27] The phrase that carries iWh is the extracted subject located in the lower Spec,CP, which is now attracted to the higher Spec,CP.[28] Since its checked uT has been deleted, it cannot check uT on any C_{WH} except the local one, which is why two movement operations must occur in every higher clause. This analysis explains why *l-* occurs in every C_{WH}, except the one where the local subject is extracted, and gives support for P&T's explanation for the locality of the subject/non-subject asymmetry – it is only there that the subject can delete the uninterpretable T feature on C_{WH}.

Finally, notice that a subject pronoun *mu* occurs in the position of the subject trace in Spec,CP of the most embedded clause in (54). I propose this to be a resumptive pronoun. This is the only case of resumption in Wolof A′-extraction, and I propose that it does not occur for syntactic reasons, but to provide a host for the complementizer *a*, which is a clitic and cannot stand on its own. I argue that the subject pronoun in case of long-distance subject extraction is the Spell-Out of the trace of A′-movement. Similar proposal is made by Engdahl (1985) for resumptive pronouns in Swedish, which are extremely limited, occurring only in the subject position of tensed clauses next to lexical complementizers. Engdahl argues that these pronouns behave like *wh*-traces and

[27] Under the assumption that Wolof does not allow for two specifier positions and that the local subject from Spec,TP cannot satisfy uT by moving to Spec,CP, since it would block the movement of the *wh*-phrase to that position.

[28] Whether or not there is an intermediate stop of the *wh*-phrase in Spec,vP is not relevant for our purposes.

should thus be analyzed in terms of a mechanism that spells out an A′-trace. Hoekstra (1995), in investigating the occurrence of resumptive pronouns in preposition stranding in some German dialects also argues that these pronouns are phonologically motivated trace spell-outs, occurring only before postpositions beginning with a vowel. I propose that, in Wolof, *a* cannot stand on its own, but must attach to an element to its left and that it cannot attach to an element in a higher projection, e.g. to the embedding complementizer *ni*, due to the fact that *ni* is in a separate prosodic domain.[29] I propose that the trace of the subject is pronounced (in the form of a pronoun) in order to provide a host for the sentential particle.[30]

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 argued that *l-*, which precedes *a* in all instances, except at the local subject extraction site, is T that moves 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 a checked *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 banned 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. *u*T), or is not close enough to be attracted by the complementizer. My analysis shows that both A′-extraction effects in Wolof—the *a/la* asymmetry which occurs with the allomorph *(l)a*, and φ-feature agreement, which occurs with CM-*u*—can be reduced to agreement between C_{WH} and other elements of the clause, and that they are the result of syntactic operations Agree and Move, which behave completely orderly.

Table 2 repeats the distribution of the two C_{WH} allomorphs in the relevant constructions in the variety of Wolof discussed in this paper.

[29] I have not systematically explored this proposal, but according to my data, speakers commonly place a pause after *ni*.

[30] Another question is why something like Prosodic Inversion (Halpern 1995) does not take place, moving the clitic *a* immediately to the right of its prosodic host at PF. The simplest answer is that this is not how the prosodic requirements of C_{WH} are satisfied in Wolof. Arregi and Nevins (2012) (Chapter 5) show that the Noninitiality requirement of some morphemes in Basque is satisfied in different ways in different dialects – some employ inversion, and others a default epenthetic process which provides an 'expletive clitic'. As shall become clearer in the following section, cross-linguistic variation in mechanisms used to satisfy post-syntactic requirements is not an exception, but the rule.

		(l)a	CM-**u**
HIGHEST C	questions	√	√
	Exhaustive Identification	√	*
	relative clauses	*	√
INTERMEDIATE C		√	*

Table 2: The distribution of allomorphs CM-*u* and *(l)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_{WH} in questions surface as either of the complementizer variants, in relative clauses only as CM-*u*, and in EI constructions and all embedded C_{WH} positions only as *(l)a*? I propose an answer to these questions in the following section.

5 The DFCF as OCP, and C_{WH} 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 sentential particle, including each other. Furthermore, there is no difference in meaning or context of use 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 allomorphs of the same complementizer, C_{WH}. In §4, I proposed that C_{WH} in Wolof has uninterpretable φ-, T- and Wh-features. However, we have seen that 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.[31] This is the purpose of this section, where I uncover another stratum responsible for some of the surface complexity of the Wolof CP-layer—the post-syntactic one—and show that the operations in the post-syntax of A′-movement structures in Wolof are not unique, or in any way disorderly, but occur in similar morphosyntactic configurations in various languages.

In particular, I claim that the surface form of C_{WH} depends on the presence or absence of the

[31] Analyses which assume they are syntactically different, such as Torrence (2005) (and his subsequent work), do not have an account of their distribution.

φ-feature (i.e. the class marker, CM) in C_{WH}, which in turn depends on the presence or absence of the φ-feature in Spec,CP. Examples from *wh*-questions show that the φ-feature is overt in only one position in the CP-layer: either in the C_{WH} head, as in (55) or in its specifier, as in (56).

(55) *Object question with (l)a*
K-an **l-a** Musaa gis?
CM-Q *l*-C_{WH} Moussa see
"Who did Moussa see?"

(56) *Object question with* CM-*u*
Y-u Musaa gis?
CM.PL-C_{WH} Moussa see
"What(pl) did Moussa see?"

If φ is overt in C, the complementizer surfaces as CM-*u* and Spec,CP is null; if Spec,CP is overt (and therefore contains an overt 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 (DFCF; Chomsky and Lasnik 1977). The Wolof case is similar, but it is only in constructions where the C_{WH} allomorph overtly exhibits φ-feature agreement that the *wh*-phrase is obligatorily absent from Spec,CP; if the A′-movement structure contains the allomorph *(l)a*, both C and Spec,CP are overt, but crucially, the φ-feature cannot be overtly present in both positions. The contribution of this paper is to provide a further step in the understanding of the DFCF by grounding it in the grammar of feature cooccurrence. Namely, I argue that the restriction on φ-feature co-occurrence in Spec,CP and C_{WH} in Wolof A′-movement is the result of two post-syntactic constraints: the morphological Obligatory Contour Principle, which prohibits adjacent identical φ-features and results in the Wolof-particular DFCF effect, and Recoverability, which prohibits the deletion of unrecoverable material. At the same time, the analysis contributes to our understanding of the domain of post-syntactic impoverishment. Finally, Wolof also gives support for a particular type of post-syntactic impoverishment, called Obliteration (Arregi and Nevins 2007, 2012; Calabrese 2010; Pescarini 2010), in which entire nodes are deleted from the surface representation. This section is dedicated to spelling out the details of this analysis.

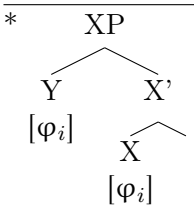
5.1 DFCF as OCP_{φ}

The partial DFCF effect in Wolof sheds new light on this phenomenon. Due to the fact that C_{WH} is always overt in Wolof, and that the DFCF effect is restricted to only a subset of A′-movement constructions—those in which C_{WH} contains an overt φ-feature—Wolof gives us a unique

opportunity to zoom in on the source of the DFCF. In this section, I show that grounding it in the grammar of feature cooccurrence straightforwardly explains the distribution of the two C_{WH} allomorphs, CM-*u* and *(l)a*.

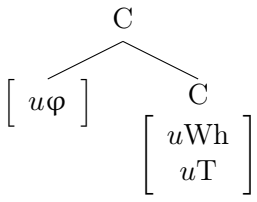
The φ-feature in the CP layer always surfaces overtly only in one place: either in the specifier, or on the complementizer. I propose that there is a morphological Obligatory Contour Principle (OCP) constraint in Wolof which prohibits identical φ-features to surface in a specifier-head configuration, as in (57).[32]

(57) *Morphological Obligatory Contour Principle (OCP_{φ}) constraint in Wolof*

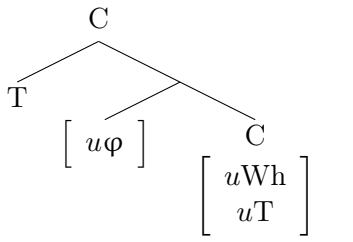


The repair to the OCP_{φ} violation is to delete the φ-feature node in C_{WH}, or to delete the entire phrase in Spec,CP. I furthermore propose that φ in C_{WH} is realized as a separate node in the post-syntax, as CM-*u* is bi-morphemic. In subject extraction, *u*T is checked via subject movement to Spec,CP, but in non-subject extraction, which leads to T-to-C movement, T is adjoined to C_{WH} above φ (see §4 for the details on *u*T valuation). The structure of C_{WH} in subject and non-subject extraction is represented in (58) and (59), respectively.

(58) *C in subject extraction*



(59) *C in non-subject extraction*



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

[32] This formalization of the OCP_{φ} constraint accounts for all of the Wolof data. There is no subject-verb agreement in Wolof, so this constraint would not interfere with φ-agreement in T. Obliviously, it is too broad for languages which have DFCF effects and subject-verb agreement in T. Since this paper does not attempt to extend the current analysis to cover all types of DFCF effects, this formulation is sufficiently precise for our purposes.

(60) *Vocabulary Insertion Rules, first version*[33]

a. $C_{WH} \rightarrow u/\varphi\_\_$

b. $C_{WH} \rightarrow a$

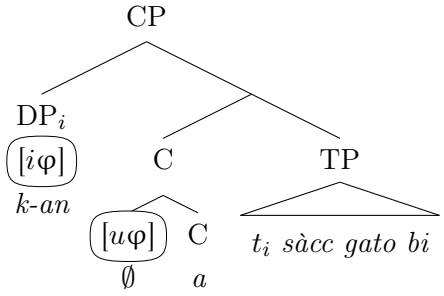
c. $T \rightarrow l/\_\_C$

When the extracted element is merged in the final Spec,CP, there are two possible resulting configurations. We start with A′-extraction in questions, in which the complementizer can surface both as *(l)a*, in (61), and as CM-*u*, in (62).

(61) *Overt φ-feature in Spec,CP*

a. K-an a sàcc gato bi?
CM-Q C_{WH} steal cake DEF
"Who stole the cake?"

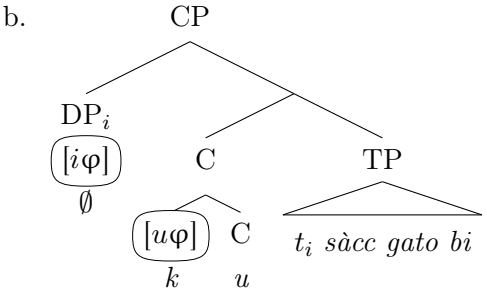
b.



(62) *Overt φ-feature in C*

a. K-u sàcc gato bi?
CM-C_{WH} steal cake DEF
"Who stole the cake?"

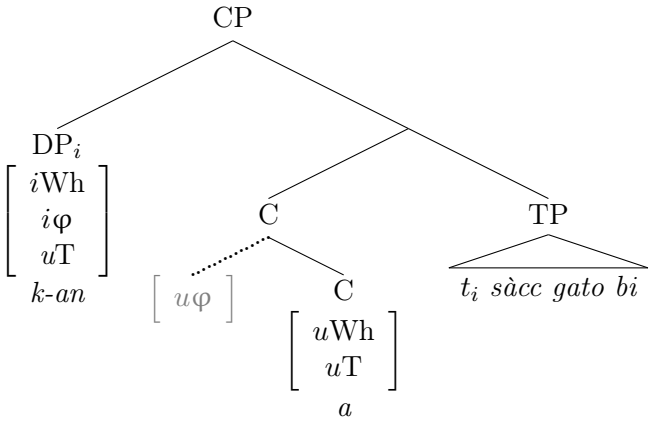
b.



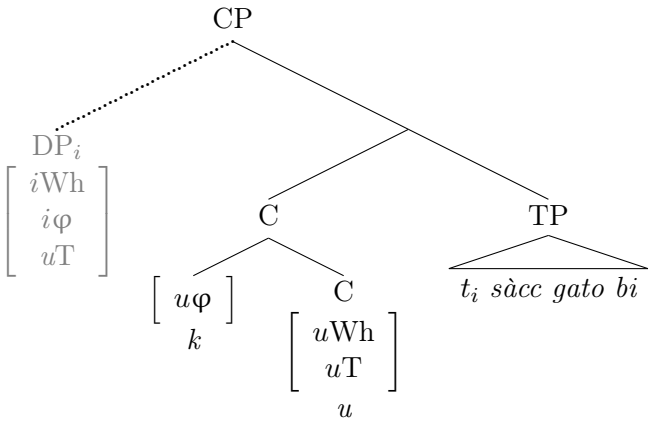
The φ-feature in these constructions occurs in two places—in C_{WH}, and in the *wh*-word in its specifier (as the class marker *k*- in both positions)—however, it is overt either in one or in the other position. I argue this to be the result of an Impoverishment rule, which militates against structures offending the OCP_{φ} constraint in (57) by deleting one of the nodes containing the φ-feature. One option is to delete the φ-feature in C_{WH}, which is realized as a separate node in post-syntax. In that case, as per the Vocabulary Insertion rules, C_{WH} surfaces as *a*, as in (61). The deletion operation is illustrated in (63a). The *wh*-phrase in this case is overt and has the form CM-*an*. The second option is to delete the *wh*-phrase. In that case φ in C_{WH} is present and conditions allomorphy: the complementizer is realized as *u*, shown in (62) and (63b). The examples illustrate subject extraction, when *u*T is checked by the subject phrase itself, as explained in §4.

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

(63) a. *Subject question with* (l)a



b. *Subject question with* CM-u



The key mechanism that derives the Wolof-specific DFCF effect is thus post-syntactic impoverishment. Impoverishment was initially proposed as a rule that deleted features (Bonet 1991, 1995), and in some approaches it is quite constrained.[34] There are, however, proposals in the literature that argue that post-syntactic deletion can target not only features, but also entire nodes (Arregi and Nevins 2007, 2012; Calabrese 2010; Pescarini 2010). For example, Arregi and Nevins (2007, 2012) show that Basque dialects systematically avoid the combination of 1*st* and 2*nd* person clitics (characterized as a dissimilation in the [Participant] feature), but there is a great deal of dialectal variation in how this violation is repaired. Some dialects delete only the person feature, changing, for example, 2*nd* person singular ergative clitic to the 3*rd* person ergative, which results in a less marked feature-value. There are, however, also instances of entire clitics being deleted from the surface representation. Such deletion, which results in the removal of the entire node, is referred

[34]For example, Noyer (1997) argues that, if two features, A and B, are targeted by a constraint such as *[A, B], only the feature lower on the feature hierarchy can delete.

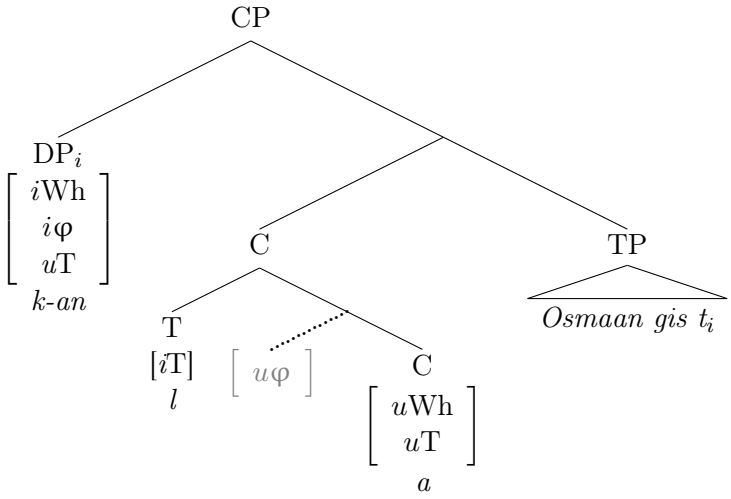
to as Obliteration. My analysis, where the entire phrase is deleted from Spec,CP, gives support for this type of impoverishment. Additional evidence for the existence of Obliteration in Wolof comes from dialectal variation in *wh*-questions with a complex *wh*-phrase in Spec,CP, discussed in §5.2.

Let us next look at non-subject extraction. When a non-subject moves to Spec,CP, uT is checked by T-to-C movement, in which case T adjoins to C (see §4). If the OCP$_\varphi$-repair deletes the node containing the φ-feature in C, as in (64), T 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, captured by the VI rule in (60c), repeated in (65).

(64) *Non-subject question with* (l)a

a. K-an l-a Osmaan gis?
CM-Q *l*-C$_{WH}$ Oussman see
"Who did Oussman see?"

b.



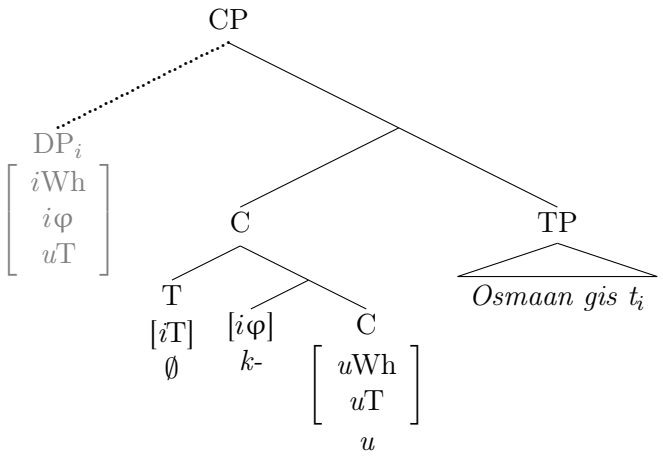
(65) T → *l*/__C

If, on the other hand, the OCP$_\varphi$-triggered repair deletes the phrase in Spec,CP, φ surfaces in C, which results in T not being overt, as it is not adjacent to C, as illustrated in (66).

(66) *Non-subject question with* CM-*u*

a. K-u Osmaan gis?
CM-C$_{WH}$ Oussman see
"Who did Oussman see?"

b.



Under the approach developed here, we do not need to assume that the complementizer CM-u selects 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$_\varphi$.

As mentioned in the introduction to this section, the OCP$_\varphi$ effect is related to the DFCF effect, and offers a new way of understanding it. These types of morphological OCP-type effects are by no means unusual. Similar post-syntactic constraints and repairs are found in various languages, and are not restricted to the CP-layer. OCP 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, haplologies, 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 (57).[35]

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 analyze the distribution of CM-*u* and *(l)a* in other constructions.

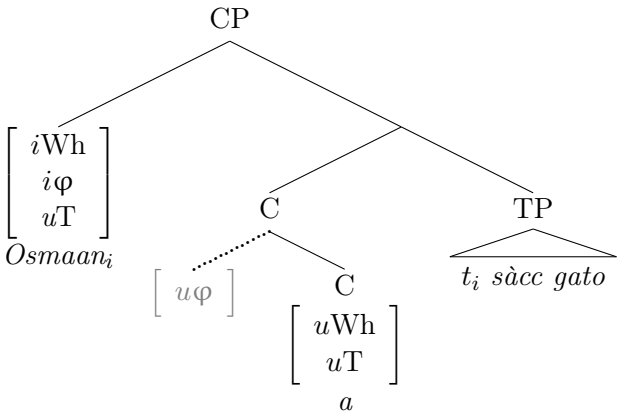
5.2 Recoverability

The only option of avoiding an OCP_{φ} violation in Exhaustive Identification constructions is to delete the φ-feature in C_{WH}, causing those structures to always surface with *(l)a*, as in extraction of an EI-ed subject illustrated in (67), and of a focused non-subject in (68).

(67) *Subject EI*

a. Osmaan$_i$ a t_i sàcc gato.
Oussman$_i$ C_{WH} t_i steal cake
"It's Oussman who stole a cake."

b.

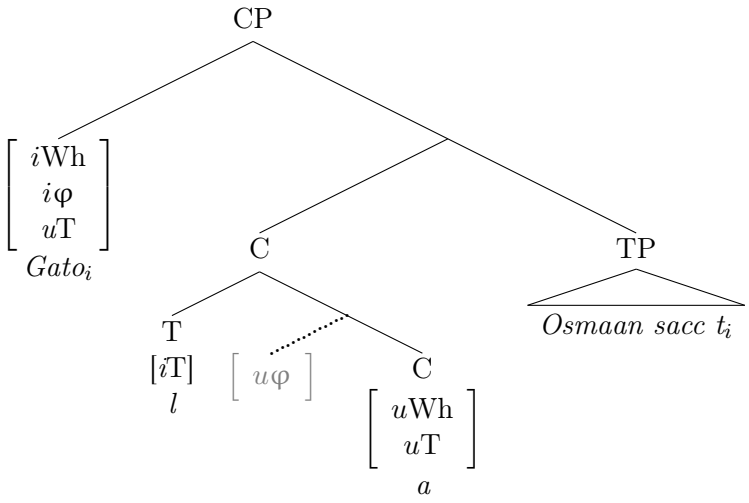


[35] If my analysis is on the right track and the DFCF has its origin in post-syntactic restrictions on feature cooccurrence, we need to say something about the fact that the DFCF is commonly active in the CP-layer, but not in the TP-layer, where agreement does not usually seem to result in this type of a dissimilation. I do not have much to say about this at this point. It is in fact possible that similar feature co-occurrence restrictions are active in the TP-layer as well, in languages which do not have overt subject-verb agreement; in fact, Wolof is precisely such a language. It is of course also possible that this is something special to the CP-layer, which will then also need to be explained. I leave this as an open question for further research.

(68) *Non-subject EI*

a. Gato l-a Osmaan sàcc.
cake *l*-C_{WH} Oussman steal
"It's a cake that Oussman stole."

b.



I argue that the obligatoriness of *(l)a* in all constructions in which Spec,CP is occupied by a lexical DP that is not a 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. The notion of deletion under recoverability dates back to Chomsky and Lasnik (1977), a similar constraint is proposed by Pesetsky (1998), in an OT-approach to the pronunciation of complementizers, and 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. 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. EI 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 the pied-piping data from §3.3, repeated here in (69), showing that complex *wh*-phrases can occur only in the specifier of *(l)a*.

Complex wh-questions can only contain (l)a

(69) a. B-an xale l-a Faatu gis?
CM-Q child *l*-C Fatou see
"Which child did Fatou see?"

b. *B-an xale b-u Faatu gis?
CM-Q child CM-C Fatou see

The obliteration of the phrase in Spec,CP is blocked, because it contains irretrievable material: the noun phrase *xale* 'child'. The deletion of the specifier node would result in the deletion of the entire DP, as in (70).

(70) *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 (70) 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. However, there seems to be dialectal variation in the amount of material from a *wh*-phrase that is allowed to remain in Spec,CP. According to Torrence (2012a), for some speakers a null *wh*-phrase can pied-pipe an NP to Spec,CP in questions:

(71) *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 my speakers 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, as in the previously mentioned case concerning Basque clitics (Arregi and Nevins 2007, 2012). Similarly, in the variety of Wolof that Torrence reports, Obliteration would target only the *wh*-word, and not the entire *wh*-phrase in Spec,CP.

More evidence in favor of an analysis which classifies the phenomenon discussed in this paper as a post-syntactic one are cases of preposition pied-piping. As shown (33), 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):

(72) *Preposition pied-piping in Wolof*

a. {Ci fan}/{Fan ci} la ñu teg téeré 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 téeré 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 *wh*-DP, which contains the φ-features. Other elements, such as prepositions, can be overt in Spec,CP of CM-*u*. Again, variation in the amount of material targeted by a particular rule is common in these types of morphological repairs: in C_{WH}, only the φ-feature (albeit contained in its own node) is deleted, in Spec,CP, the whole *wh*-phrase containing the φ-feature must go, but a preposition in the PP which got pied-piped by the *wh*-phrase is not in danger – still only the *wh*-phrase deletes.

I have now offered an analysis for the occurrence of both C_{WH} allomorphs in *wh*-questions, and the obligatoriness of *(l)a* in EI constructions. The distribution of CM-*u* and *(l)a* in A′-movement constructions in Wolof is repeated here in Table 3.[36]

		(l)a	CM-**u**
HIGHEST C	questions	√	√
	Exhaustive Identification	√	*
	relative clauses	*	√
INTERMEDIATE C		√	*

Table 3: The distribution of allomorphs 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 we expect to contain all retrievable material, just like the *wh*-phrase, 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_{WH} positions, it is φ in C_{WH} 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

[36]Recall from Table 1 that two other A′-movement structures, comparative constructions and copular sentences with nominal predicates, also contain *(l)a*. As it was mentioned in footnote 8, other syntactic differences aside, their CP-layers are identical in that they involve movement of a non-*wh* DP to Spec,CP. Recoverability therefore prohibits their deletion, and such constructions also surface only with *(l)a*.

as final landing positions with respect to OCP_{φ} and Recoverability. My analysis can explain both cases.

5.3 Relative clauses

First, let us examine the predictions of the analysis presented thus far for C_{WH} in relative clauses.[37] Under the assumption that Spec,CP in relative clauses contains a relative operator, which we would expect to have all the same features as C_{WH} in relative clauses (specifically, the φ-feature), we should get the same variability as in *wh*-questions, and relative clauses should surface with both CM-*u* and *(l)a*. This, however, is not the case, and C_{WH} in relative clauses can only surface as CM-*u*, as in the examples in (73).

(73) *Wolof relative clauses*

a. xaj **b-u** ma bëgg
dog CM-C_{WH}.INDEF 1SG like
"*a dog that I like*"

b. xaj **b-i** ma bëgg
dog CM-C_{WH}.DEF.PROX 1SG like
"*the dog here that I like*"

c. xaj **b-a** ma bëgg-oon
dog CM-C_{WH}.DEF.PROX.DIST 1SG like-PST
"*the dog there that I like*"

C_{WH} in relative clauses, however, featurally differs from the one in questions. As can be seen from (73), in addition to noun class, it encodes definiteness and proximity, having three allomorphs – CM-*u*, CM-*i* and CM-*a*. Determiners,[38] in (74), 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 spacially proximal entity, and the latter a distal one.

(74) a. *Indefinite determiner*
a-b xaj
INDEF-CM.SG dog

[37] CM-*u* also occurs in temporal clauses and conditionals, which are a type of relative clause (Torrence 2012a), differing in some ways from regular relative clauses, but not in the shape of the CP-layer. In this paper I restrict the discussion to simple relative clauses, assuming that the analysis extends to temporal and conditional clauses.

[38] Wolof is for the most part a head-initial language. Interestingly, it has a mixed determiner system, where the indefinite determiner is pre-nominal, and definite determiners post-nominal.

"*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 the same meaning: 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).[39]

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 (75). [40]

(75) *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*"[41]

[39]The three versions of this complementizer differ in their distribution. Only CM-*u* can be used in questions, and only CM-*i* in certain free relative constructions (Caponigro and Heller 2007). In this paper, I am disregarding these distributional facts, though the definiteness of the complementizer plays an important role in my analysis, discussed in §5.

[40]In the variety of Wolof examined by Torrence (2012a,b), the determiner can optionally surface on the edges of the relative clause (the definite ones on the right, and the indefinite on the left edge), 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*"

Such forms are not grammatical for any of my speakers, however, 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, as elaborated on later in this section.

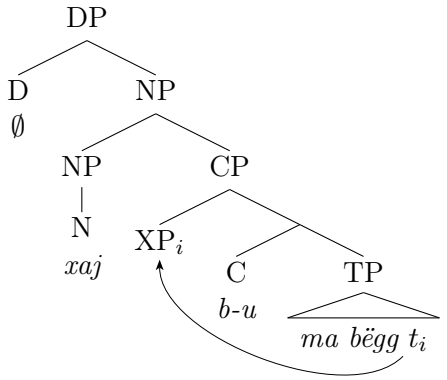
[41]In my data, CM-*a* is always accompanied by the past tense morpheme *-oon* on the verb, indicating that the state or event is removed in time from the moment of speaking.

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 (75b) and (75c), 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 (75a), which is prenominal, and which differs in form from the complementizer.[42] I therefore propose that C_{WH} in relative clauses, in addition to the φ-feature, carries the definiteness and proximity features. It obtains these features not via agreement with the *wh*-phrase in Spec,CP, but via agreement with D of the external head.

I follow the *matching analysis* (Lees 1960, 1961; Chomsky 1965; Sauerland 1998, 2003 among others), and assume that Wolof relative clauses, as in (76a), have the syntax in (76b): a relative operator co-indexed with the head noun is located in Spec,CP, and the relative CP is adjoined to the head NP.

The syntax of Wolof relative clauses

(76) a. Xaj **b-u** ma bëgg.
dog CM-C_{WH} 1SG like
"*a dog that I like*"

b.


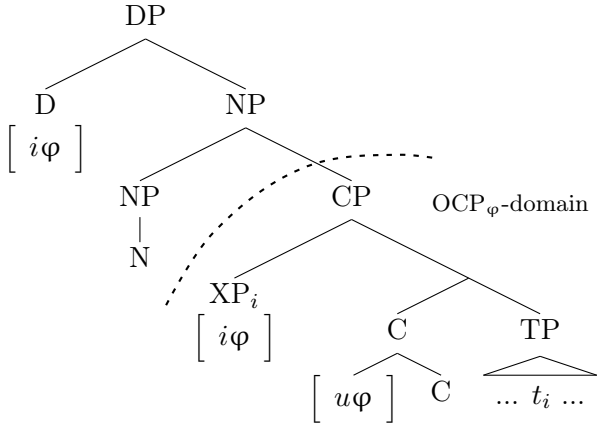
The reason for assuming a head-external representation of Wolof relative clauses is maintaining the generalization that Spec,CP of CM-*u* is always empty, as we have seen is the case in *wh*-questions. Torrence (2005, 2012a,b) advocates a structure for Wolof relative clauses in which the relativized 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. In the here adopted *matching analysis*, an

[42] It also cannot account for Torrence's data, in which the determiners can optionally surface on the edges of relative clauses.

internal head corresponding to the external head is located in Spec,CP, and then deleted under identity with the external head.[43] The representation in (76b) maintains 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 (77), meaning that the φ-feature in D is not taken into consideration in evaluating markedness.

(77) *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 of matrix questions: the complementizer should surface as either CM-*u* or *(l)a*; if the former, the operator should be absent, and if the latter, it should be 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: the φ-feature complex in relative clauses, in addition to the class feature, contains the definiteness feature and the proximity feature. They are 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

[43] Another possibility which can account for reconstruction effects is the *head raising* analysis (e.g. Brame 1968; Schachter 1973; Vergnaud 1974; Åfarli 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). Whether one of the two analyses should be given preference in Wolof is not relevant for the present purposes, and is left for future research.

need to be made more precise:

(78) *Vocabulary insertion rules, second version*[44]

a. C[+Wh] → $u/\{\varphi, -Def\}$__

b. C[+Wh] → $i/\{\varphi, +Def, +Prox\}$__

c. C[+Wh] → $a/\{\varphi, +Def, -Prox\}$__

d. C[+Wh] → a

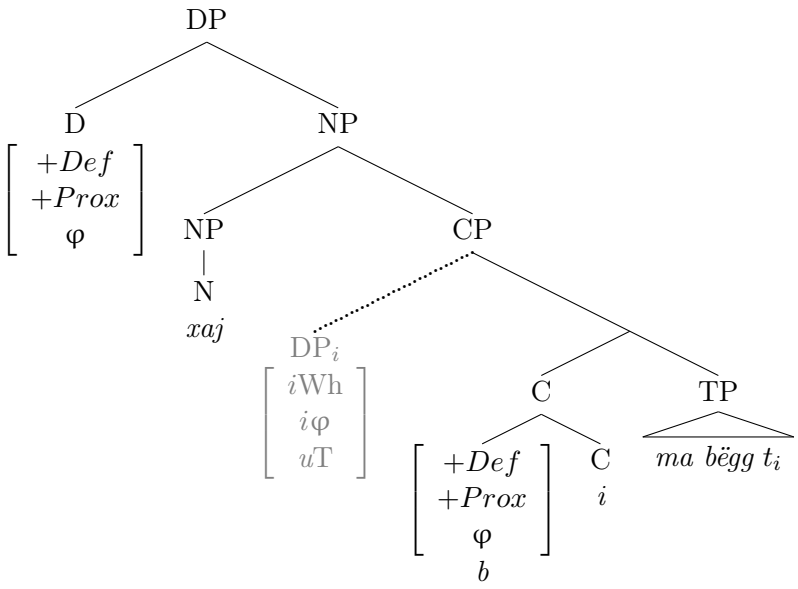
e. T → l/__C

I argue that the reason for the obligatory deletion of the relative operator in Spec,CP lies precisely in the fact that the φ-feature complex in C_{WH} of relative clauses does not contain only the class and number features, but also definiteness and proximity. Recoverability therefore prevents the deletion of irretrievable material, protecting the deletion of φ in C_{WH}.[45] The only option, then, is to delete the operator in Spec,CP, which causes the φ-feature in C_{WH} to be pronounced and the complementizer to surface as *-u*, *-i*, or *-a*, per the Vocabulary Insertion rules in (78).

Obligatory deletion of Spec,CP in relative clauses

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

b.



[44]Technically, the Vocabulary Insertion rule in (78c) is not necessary, since the exponent for the definite distal complementizer is homophonous with the exponent for the elsewhere condition in (78d). I posit two rules to make the distinction between the two complementizer forms clearer.

[45]This rests on the assumption that the complementizer obtains proximity and definiteness via agreement with D of the external head, and that the relative operator does not inflect for these features.

A reviewer points out significant tension between the notion of recoverability used here, and the one known from Chomsky and Lasnik (1977). In their influential paper *Filters and control*, they explain the ability to delete the *wh*-words in English relative clauses as a result of their recoverability due to their relation with the relative clause head. Interrogative pronouns in English, bearing no relation with another head, cannot be deleted. In my analysis, however, interrogative pronouns can be deleted. If Chomsky and Lasnik are right about English, and if my analysis of Wolof is on the right track, the difference between the two languages needs to be addressed. One obvious difference between English and Wolof is in the fact that Wolof has an overt C_{WH} which agrees in φ-features with the phrase in its specifier. The *wh*-phrase's features really are recoverable from C_{WH} in Wolof. This is not the case in English. Furthermore, I have proposed the domain of OCP_{φ} to be the CP-layer, excluding the head noun. It is conceivable that domains in which DFCF-type constraints occur show cross-linguistic variation.

And finally, a note on the restriction of co-occurrence of C_{WH} and D in relative clauses. In the dialect of Wolof that this paper is concerned with, D never occurs in relative clauses. The fact that the definiteness feature does not surface twice is reminiscent of a similar phenomenon in some Scandinavian languages. In Wolof, the two heads, D and C_{WH}, agree in φ-features, definiteness and proximity. As a result, the determiner and the complementizer have identical feature specifications. I propose that in such a case only one of the two heads can be pronounced, and that in this configuration in Wolof, it is the lower one. The determiner is therefore deleted. That this analysis is on the right track is corroborated by data in Torrence 2012a,b, where in some dialects the determiner can optionally surface on the edges of the relative clause, reported here in footnote 40. Such variation is expected in the scenario sketched above: in some dialects the expression of identical features in two different heads is prohibited, in others it is not. A similar restriction exists in some Scandinavian languages (Embick and Noyer 2001; Hankamer and Mikkelsen 2002, 2005, i.a.), where the definite feature can occur in two positions inside the DP – as a suffix on the noun, or as an article, depending on the presence or absence of adjectival modifiers. In some languages, for example in Danish, the definite determiner can only be expressed once. Swedish and Norwegian, on the other hand, exhibit the phenomenon of Double Definiteness, whereby the presence of a modifier requires the definite feature to surface both as an article, and as a suffix on the noun. The variation in the expression of definiteness in Wolof is similar: in some dialects it can only be expressed on

one head, while other dialects allow the determiner to optionally surface on the edges of the relative clause. The details of this proposal are left for future research. What is important to stress, is that the deletion of the determiner of the head noun in the relative clause is not the OCP_{φ}-triggered deletion that occurs in the CP-layer, and is presumably handled by a different mechanism.

5.4 Intermediate traces

In long-distance extraction in Wolof, every intermediate C_{WH} position is overt. In the variety of Wolof discussed in this paper, the only allomorph allowed in intermediate positions is *(l)a*, as in (80), meaning that the OCP_{φ} violation in a non-final CP-layer can only be avoided by deleting the φ-feature in C_{WH}.

(80) *Long-distance object extraction in Wolof*
[$_{CP2}$ K-an$_i$ l-a Isaa wax ne [$_{CP1}$ t_i l-a xaj bi matt t_i]]?
[$_{CP2}$ CM-Q *l*-C_{WH} Isaa say that [$_{CP1}$ t_i *l*-C_{WH} dog DEF bite t_i]]
"Who did Isaa say that the dog bit?"

Torrence (2005, 2012a,b) shows data from a dialect in which either *l-a* or CM-*u* can occupy intermediate C positions, repeated in (81) (example from Torrence 2012b, p.1173), meaning that in this case CP-layers in intermediate clauses behave the same as the topmost CP-layer.

(81) CM-u *in intermediate positions in long-distance extraction*

a. **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 IMPF hit
"Who did Kumba say that Isa thought that Maryam will hit?"

b. **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 IMPF hit
"Who did Kumba say that Isa thought that Maryam will hit?"

I propose the source of variation between the two dialects to be in the timing of Spell-Out and movement out of the spelled out domain. The crucial innovation that I am proposing is in the ordering of the operations triggered by a phase head, which plays two roles. As any other head, it has functional features it needs to have checked. But it also triggers Spell-Out of its complement, which encompasses post-syntactic processes. If we do not impose a pre-determined order on these two operations performed by the head, we predict that we could have two types of languages, or

even two types of interactions between syntax and post-syntax in one and the same language. In one case, the phase head first satisfies its requirements (i.e. checks its features), and then triggers Spell-Out of its complement. We can however also imagine that the phase head triggers Spell-Out of its complement first, and then continues with narrow syntactic processes in which its features are checked, which may involve attracting elements from inside its complement, which is already spelled out. Though not standard, this view of the interaction between syntax and post-syntax is not radical, considering the existence of phenomena in which syntactic operations seem, to a certain extent, to depend on morphological facts, leading to proposals of either moving a syntactic process into post-syntax (e.g. agreement in Bobaljik 2008), or by treating post-syntax as part of syntax proper (e.g. the reanalysis of head movement in Matushansky 2006). Fox and Pesetsky (2005) also 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. By adding linearization to Spell-Out, their analysis crucially predicts that some syntax can happen after post-syntactic processes have already applied.[46]

I propose that in the Wolof dialect discussed in this paper, the Spell-Out of C_{WH}'s complement precedes checking of C_{WH}'s features. This has direct consequence on the availability of the two post-syntactic repair strategies (deletion of the φ-feature in C_{WH} and the *wh*-phrase in Spec,CP) in long-distance extraction. I propose that, 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. Consider the sentence in (80), repeated in (82), exemplifying long-distance extraction of an object *wh*-phrase.

(82) *Long-distance object extraction in Wolof*
[$_{CP2}$ K-an$_i$ l-a Isaa wax ne [$_{CP1}$ t_i l-a xaj bi matt t_i]]?
[$_{CP2}$ CM-Q *l*-C_{WH} Isaa say that [$_{CP1}$ t_i *l*-C_{WH} dog DEF bite t_i]]
"Who did Isaa say that the dog bit?"

The reader should keep in mind that we are not concerned with the Spell-Out of C_{WH}'s complement (the TP), but with the Spell-Out of the CP-layer itself, which is triggered by a higher phase head. For 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, and not, for example *v*. Once Spell-Out is initiated, all the described

[46] On more evidence for post-syntactic processes being able to feed syntax, see Author 2015.

post-syntactic processes take place, in the way explained for matrix *wh*-questions. The result is then that either φ in C_{WH} or the whole Spec,CP node delete, resulting in the complementizer surfacing as either *(l)a* or CM-*u*, respectively:

(83) *Deletion of φ in C, Step1*
$[_{CP2}$ C ... $[_{CP1}$ k-an$_i$ l-a xaj bi matt t_i]]
$[_{CP2}$ C ... $[_{CP1}$ CM-Q *l*-C_{WH} dog DEF bite t_i]]
"who did the dog bite?"

(84) *Deletion of Spec,CP, Step1*
$[_{CP2}$ C ... $[_{CP1}$ ∅ k-u xaj bi matt t_i]]
$[_{CP2}$ C ... $[_{CP1}$ ∅ CM-C_{WH} dog DEF bite t_i]]
"who did the dog bite?"

After triggering Spell-Out, the higher C_{WH} head proceed to check its features, meaning that the *wh*-phrase in CP1 is only attracted to the Spec,CP2 after the described post-syntactic processes have taken place. If the φ-feature in C_{WH} is deleted, as in (83), the *wh*-phrase is present in Spec,CP1 and can move to Spec,CP2, as in (85). The Spell-Out of the CP2 layer proceeds in the same way, with two possible outcomes:

(85) *Deletion of φ in C, Step2*
$[_{CP2}$ {K-an$_i$ l-a}/{K-u} Isaa wax ne $[_{CP1}$ t_i l-a xaj bi matt t_i]]?
$[_{CP2}$ {CM-Q *l*-C_{WH}}/{CM-C_{WH}} Isaa say that $[_{CP1}$ t_i *l*-C_{WH} dog DEF bite t_i]]
"Who did Isaa say that the dog bit?"

If, however, the phrase in Spec,CP of CP1 is deleted as a result of the OCP_{φ} repair, as in (84), 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 (86)), and the derivation in which φ in C is deleted is the only one that converges, meaning that, if movement out of the spelled out domain happens after Spell-Out, *(l)a* is the only exponent that can surface in intermediate positions.

(86) *Deletion of Spec,CP, Step2*
*$[_{CP2}$ __ C Isaa wax ne $[_{CP1}$ ∅ k-u xaj bi matt t_i]]
$[_{CP2}$ __ C Isaa say that $[_{CP1}$ ∅ CM-C_{WH} dog DEF bite t_i]]

Let us now investigate the second option, in which the phase head first checks its features and then triggers 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.[47] 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 (87), can surface in the intermediate position. However, if CM-*u* can occupy intermediate positions, this should only occur in *wh*-questions, and never in EI constructions, due to Recoverability.

(87) *Successive cyclic movement follows Spell-Out*
$[_{CP2}$ {K-an$_i$ l-a}/{K-u} Isaa wax ne $[_{CP1}$ {∅ k-u}/{t_i l-a} xaj bi
$[_{CP2}$ {CM-Q *l*-C$_{WH}$}/{CM-C$_{WH}$} Isaa say that $[_{CP1}$ {∅ CM-C$_{WH}$}/{t_i l-C$_{WH}$} dog DEF
matt t_i]]?
bite t_i]]
"Who did Isaa say that the dog bit?"

These predictions are confirmed by the data. In the variety of Wolof discussed in this paper, only *(l)a* can occupy intermediate positions of movement, meaning that in that dialect, Spell-Out precedes movement. Torrence (2005, 2012a,b) shows data in which CM-*u* is allowed in intermediate positions, alongside *(l)a* (see (32)), and, as expected if this analysis is on the right tract, he only reports such an option for *wh*-questions, never EI constructions. 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$_{WH}$ positions, and indeed, my analysis predicts that such a dialect should not exist.

In this section I argued for a post-syntactic analysis of the A′-complementizer distribution in Wolof, attributing the difference between complementizer form in different A′-movement constructions to the interplay of a morphological OCP$_\varphi$ constraint, which prohibits adjacent identical 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

[47] The 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.

and two extraction effects that occur in Wolof: complementizer agreement and a subject/non-subject asymmetry.

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 and syntax interaction 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 occu-

pying 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.

The more far-reaching contribution of the paper is the view of the grammar that it promotes. The increased interest in lesser known languages which seemingly greatly differ from the Indo-European types in their syntax and morphology raises questions as to the tenability of linguistic universals and the uniformity of syntactic structures and processes. This research shows that, as long as we carefully examine the root of apparent syntactic irregularities in various languages, we can expect to find that their origin is not in underlying syntactic differences or derivations, but in processes that happen on the interface of syntax and other modules of the grammar. It is only the incomplete understanding of those other modules and their interactions with syntax that casts doubt on the cross-linguistic uniformity of syntactic structure.

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