The morpho-syntax of silent wh-expressions in Wolof

by Harold Torrence

2012

The Morpho-Syntax of Silent Wh-expressions in Wolof

Harold Torrence

Abstract This paper analyzes the morphology and syntax of wh-expressions and agreeing complementizers in Wolof, an Atlantic language. I argue that Wolof possesses a set of null wh-expressions in addition to a set of overt wh-expressions. The null wh-expressions occur in a relative clause-like construction in which they trigger agreement on a complementizer. I examine the properties of the null wh's and compare them to the overt wh's in Wolof. I provide evidence that the null wh's, like the overt wh's, move successive cyclically and may trigger agreement on intermediate complementizers that occur in the movement pathway. I also compare the Wolof construction to a superficially similar complementizer agreement construction in the Bantu language Kinande, null operators in German, and wh-drop in Dutch.

**Keywords** Wolof · Wh-Movement · Agreement · Complementizer· Connectivity · Successive Cyclicity

1. Introduction
1.1. The *u*-Construction
This paper investigates the morpho-syntax of a wh-construction (i.e. an operator-trace construction) in Wolof, an Atlantic language of Senegal. I call this construction the "*u*-construction" and argue that Wolof possesses a set of null wh-expressions that only occur in the *u*-construction. A wh-interrogative formed by means of the *u*-construction is exemplified in (1):

(1) **K-u**   Ayda dóór[1]   *u*-Construction
    CM-*u*   Ayda hit
    'Who did Ayda hit?'

The *u*-construction is overtly characterized by the presence of an "*u*-form", in bold. The *u*-form in (1) is composed of a noun class marker ("CM"), *k-*, followed by *-u*. In fact, (1) is interpreted as asking about *who* Ayda hit rather than *what* Ayda hit because of the presence of the singular human noun class marker *k-*. I argue that *u*-forms like *k-u* are complementizers that agree in noun class with a silent wh-expression that has raised to their specifier, as in (2):

(2)
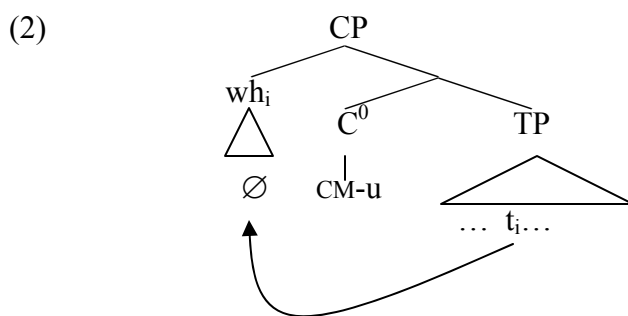
H. Torrence (✉)
Department of Linguistics, University of Kansas, 1541 Lilac Lane, Blake Hall-Room 427,
Lawrence, KS 66044-3177, USA
email: torrence@ku.edu

[1] Abbreviations: BEN-benefactive, Clt$_{Loc}$-locative clitic, Clt$_O$-object clitic, Clt$_S$-subject marker, CM-class marker, COMP-complementizer, COND-conditional particle, def.dist-definite distal, def.prox-definite proximal, FRC-force marker, IMPERF-imperfective marker, indef- indefinite article, INSTR-instrumental suffix, LOC-locative (adjunct) suffix, MANN-manner suffix, OPT-optative, PAST.HAB-past habitual, PERF-perfective marker, SUBJUNC-subjunctive, xpl-expletive

The key insight for the analysis in (2) comes from close examination of the distribution of the *u*-forms, which also occur in relative clauses and other subordinate clause constructions. Crucially, we will see that the *u*-forms can also occur in constructions that do not contain gaps and where wh-expressions are banned, which argues against an analysis of the *u*-forms as wh-expressions.

In addition to the null wh-expressions that I argue for, Wolof possesses a set of overt wh-expressions, the "*an*-forms", which occur in clefts:

(3) **K-an** l-a   Ayda dóór   *an*-Form Question (Cleft)
    CM-*an* xpl-*a* Ayda hit
    'Who did Ayda hit?'
    (Lit. 'Who is it that Ayda hit?')

The *an*-form (in bold) in (3), *k-an*, is composed of the singular human noun class marker *k-*, followed by the wh-element *–an*. In the cleft in (3), the *an*-form precedes the expletive ("xpl") *l-* and the copular element *–a*. In this paper, I bring in discussion of the *an*-forms only where they they shed light on the *u*-construction. (I have discussed the *an*-forms and clefts elsewhere: Torrence 2005, 2008a, 2008b.)

The paper is organized as follows. Section 2 presents background on Wolof. Section 3 introduces the basic distribution of the *u*-forms and wh-questions. In Section 4, relative clauses are introduced and their relationship to the *u*-construction discussed. This section lays out the central structural components of relative clauses and their movement properties. Section 5 contains the main argumentation that the *u*-forms are complementizers. Section 6 argues for the existence of null wh-expressions in Wolof. Following this, I discuss the properties of the null wh's and compare them to silent operator constructions in other languages. Section 7 discusses the relationship between agreement and successive cyclic movement of null and overt wh's. Section 8 further explores the properties of Wolof null wh's by presenting connectivity effects and comparing the connectivity effects in Wolof to those in Kinande, a Bantu language. Section 9 examines phenomena unresolved by the analysis that I propose in (2). Section 10 presents conclusions and open issues for future research.

2.   Background on Wolof
This section presents some of the basic morpho-syntax of Wolof clauses and a brief discussion of the noun class system. Wolof displays basic SVO word order and typologically mixed head-initial/head-final characteristics (e.g. post-nominal relative clauses and prepositions, but pre-nominal indefinite determiners, and Wolof is almost exclusively suffixing):

(4) Xaj   y-i   lekk-na-ñu ceeb b-i   ci kër   g-i
    dog   CM.pl-def.prox eat-FIN-3pl rice CM-def.prox P house CM-def.prox
    'The dogs ate the rice at the house'

In (4), the (plural) definite article *y-i* follows its NP complement *xaj* 'dog'. The nouns *xaj* 'dog', *ceeb* 'rice', and *k*ër 'house' occur with three distinct definite articles, *y-i*, *b-i*, and *g-i* because they each belong to different noun classes. Verbs in Wolof do not agree with their subjects or objects in class. Because no single constituent in (4) is being focused, the verb precedes the 'neutral' complementizer *–na*, which sits in FIN (Rizzi 1997).[2]

Like the other Atlantic languages (Migeod 1911, Greenberg 1963, Sapir 1971, Wilson 1989), Wolof is a noun class language with an intricate system of noun class agreement. Class membership is not typically indicated on the noun itself, but on other elements in DP, such as articles and demonstratives. Wolof has approximately 15 noun classes (depending on the

analysis): 8 singular, 2 plural, 2 locatives, 1 diminutive, 1 manner, and 1 collective human class. Throughout, I refer to the different noun classes by the form of the proximal definite article. The plural class of most nouns is the *yi*-class while a small group of human nouns take plurals in the *ñi*-class. The basic singular and plural noun classes are exemplified in Table 1:[3]

(5)   Table 1 Wolof Noun Classes

Noun	Definite Article	Translation	Class Name	Number
yàmbaa	**j**-i	the marijuana	'*ji*-class'	Singular
nit	**k**-i	the person	'*ki*-class'	
xaj	**b**-i	the dog	'*bi*-class'	
mbagg	**m**-i	the shoulder	'*mi*-class'	
weñ	**w**-i	the metal	'*wi*-class'	
suuf	**s**-i	the ground	'*si*-class'	
ndap	**l**-i	the pot	'*li*-class'	
góór	**g**-i	the man	'*gi*-class'	
xaj	**y**-i	the dogs	'*yi*-class'	Plural
góór	**ñ**-i	the men	'*ñi*-class'	

I label the two locative classes and the manner class as "defective" because these classes do not contain any overt nouns. Instead, these classes contain demonstratives, articles, and wh-words, for example.

(6)   Table 2 Defective Noun Classes

'this X'	wh-word	Class Name	Semantics
n-ii 'this way'	**n**-an 'how?'	'*ni*-class'	manner, means
f-ii 'here'	**f**-an 'where?'	'*fi*-class'	location
c-ii 'in/at/on here'	%**c**-an 'in/at where'	'*ci*-class'	location

The determiner system of Wolof is built around a three-way contrast involving two definite articles and an indefinite article. All articles agree with the noun in class:

(7) a. xaj b-**i**   b. xaj b-**a**   Definite Articles
       dog CM-def.prox   dog CM-def.dist
       'The dog (near)'   'The dog (far)'

       c. **u**-b   xaj   Indefinite Article[4]
         indef-CM dog
         'a dog'

The definite articles obligatorily follow NP, while the indefinite article obligatorily precedes NP. The *CM-i* definite article (in (7a)) contains the determiner vowel -*i* and encodes proximity in space, time, or conversation (roughly, 'the x mentioned recently'). The *CM-a* definite article (in (7b)) contains the determiner vowel -*a* and encodes distality in space, time, or conversation (roughly, 'the x mentioned a while ago'). The indefinite article contains the determiner vowel *u-*, as in (7c). The orderings are summarized in Table 3:

---

[3] See Sy (2003) for detailed discussion of Wolof noun classification.
[4] In addition, there is an indefinite article that is homophonous with the numeral '1', which also agrees in class.

(8) Table 3   Wolof Articles

definite proximal		NP CM-i
definite distal		NP CM-a
indefinite	u-CM	NP

Given that most plural nouns are homophonous with singular nouns, I gloss plural nouns by indicating 'pl' following the class marker:

(9) a. xaj   **b**-i   b. xaj   **y**-i
      dog   **CM**-def.prox   dog   **CM.pl**-def.prox
      'the dog'   'the dogs'

In the present work, I concentrate mainly on data from the St. Louis (Ndar) dialect, spoken in northern Senegal. However, I also bring in data from the Dakar variety spoken in the capital.

3.   The Distribution of the *u*-Forms

3.1. Basics of the *u*-forms
Canonically, the *u*-forms can be used to form wh-interrogatives questioning subjects, objects, locatives, manners, and instrumentals, as long as the question corresponds to one with a 'simple' wh phrase, e.g. 'who', 'what', 'how':[5]

(10) a. **K-u**   togg ceeb ak jën   Subject
        CM-*u*   cook rice and fish
        'Who cooked rice and fish?'

     b. **Y-u**   jigéén   j-i   togg   Direct Object
        CM-*u*   woman CM-def.prox cook
        'What(pl) did the woman cook?'

     c. **F-u**   jigéén   j-i   togg-e   ceeb ak jën   Locative Adjunct
        CM-*u*   woman CM-def.prox cook-LOC rice   and fish
        'Where did the woman cook fish and rice?'

     d. **Ñ-u**   ngeen ubbé-él   bunt   b-i   Applied Object
        CM-*u*   2pl   open-BEN door   CM-def.prox
        'Who(pl) did y'all open the door for?'

     e. **L-u**   Isaa ubbé-é   bunt y-i   Instrumental Object
        CM-*u*   isaa open-INSTR door CM-def.prox
        'What did Isaa open the doors with?'

An *u*-form can be formed with any of the noun class markers: *b*-, *w*-, *m*-, *k*-, *ñ*-, *y*-, *l*-, *s*-, *f*-, *c*-, *n*-, *g*-, *j*-. This can be seen in (10) (and (11) below), where various noun class markers occur preceding –*u*-. Note too that the interpretation varies according to the noun class marker. In (10a), where the class marker is *k*-, from the singular human *ki*-class, the interrogative clause is

---

[5] There are no *u*-forms that correspond to 'why' or 'how many'. For the St. Louis dialect there is no *u*-form that can be used to ask 'when'. However, some speakers of the Dakar dialect do allow this.

4

interpreted as asking about *who*, as in (1). In (10c) for example, where the class marker is *f-*, from the locative *fi-*class, the interrogative clause is interpreted as asking *where*.[6]

(11) below contains examples of interrogative *u*-constructions from the *wi-* and *mi-* noun classes. They can be answered by mentioning an item from that noun class. Thus, the interpretation of the wh-question (i.e. the answer it can receive) is restricted by the class markers:

(11) a. **W-u** ngeen bëgg-ë jënd   *wi*-class
      CM-*u* 2pl   want-*a* buy
      'What (*wi*-class item) do y'all want to buy?'

    b. **M-u** mu lekk   *mi*-class
      CM-*u* 3sg eat
      'What (*mi*-class item) did he eat?'

All of the interrogative *u*-constructions in (10) have an equivalent that involves the *an*-forms. Consider the *an*-form equivalents of (10) in (12). The *u*-forms, like *k-u* and *y-u* below, never occur in a cleft clause:[7]

(12) a. **K-an/*k-u** mu-a togg ceeb ak jën   Subject
      CM-*an*/CM-*u* 3sg-*a* cook rice and fish
      'Who is it that cooked rice and fish?'

    b. **Y-an /*y-u** l-a   jigéén j-i   togg   Direct Object
      CM-*an*/CM-*u* xpl-*a* woman CM-def.prox cook
      'What(pl) is it that the woman cooked?'

In (12a), the subject *an*-form appears in a subject cleft and corresponds to (10a). In (12b), which corresponds to (10b), the *an*-form direct object appears in non-subject cleft, which is marked by the presence of the expletive *l-* (just as in (3)). Both cleft types contain the copula *-a*. An interrogative clause like (12b), with the *an*-form *y-an*, is interpreted as asking about "what(pl)" because the noun class marker *y-* corresponds to the *yi*-class, which is the default plural "thing" noun class.

Indirect wh-interrogatives can be constructed with *u*-forms and with *an*-forms:

(13) a. Bëgg-na-a   xam [CP **n-u** mu-ko   def-e]   *u*-Construction
      want-FIN-1sg know   CM-*u* 3sg-3sgOBJ do-MANN
      'I wonder how he did it'

    b. Bëgg-na-a   xam [CP **n-an** l-a-ko   def-e]   Cleft
      want-FIN-1sg know   CM-*an* xpl-*a*-3sgOBJ do-MANN
      'I wonder how it is that he did it'

There is no clear-cut interpretive difference between wh-interrogatives that have *u*-forms and those that have *an*-forms. Both *u*-forms and *an*-forms occur in D-linked environments and non-D-linked contexts, and both occur in out-of-the-blue questions. For, example, if someone is in her office I can walk in and ask:

---

[6] In simple *u*-questions, the *u*-form is stressed (Zribi-Hertz and Diagne 2002) and pronounced with audibly higher pitch than the rest of the question. To the ear, the pitch begins very high on the *u*-form and rapidly drops. Impressionistically, this is also an intonational property of *yes/no* questions, wh-questions, and focus cleft clauses in Wolof. See Rialland and Robert (2001) for details on Wolof intonation.
[7] Wolof has three morphosyntactically distinct cleft constructions: subject, non-subject, and predicate focus (Sauvageot 1965, Church 1981, Njie 1982, Robert 1986, Kihm 1999, Torrence 2005, 2008b).

(14) a. **F-u**   a   dem démb?   *u*-Form
            CM-*u* 2sg go   yesterday
            'Where did you go yesterday?'

     b. **F-an**   nga   dem démb?   *an*-Form
            CM-*an* 2sg+xpl+*a* go   yesterday
            'Where did you go yesterday?'

In asking (14a) or (14b), the speaker could have a set of locations in mind from a list, there could be a set of locations previously under discussion, or the speaker may have no idea of where the addressee could have gone. In fact, both *u*-forms and *an*-forms occur in a variety of wh-question constructions including echo questions, surprise questions, aggressively non-D-linked questions, and obligatorily D-linked questions.[8] Thus, *u*-construction questions and *an*-form cleft questions are both appropriate in a range of similar semantic contexts.

    In summary, there are *u*-forms and *an*-forms for all noun classes in the language. In addition, both *u*-form interrogatives and *an*-form interrogatives receive the same interpretation and exhibit the same range of use. It is important to reiterate that both *u*-forms and *an*-forms occur in out-of-the-blue contexts. This excludes analyses in which either interrogative type must be tied to the discourse by the presence of an antecedent. The next section expands the discussion of the *u*-forms to include relative clauses.

4. Relative Clauses and the *u*-Construction
4.1. Initial Characterization of Wolof Relative Clauses

This section focuses on Wolof relative clauses and lays out their basic morphological and syntactic properties. Relative clauses are relevant for the analysis of the *u*-construction because they share several basic properties. Understanding relative clauses will therefore help to elucidate the morpho-syntax of the interrogative *u*-construction.

    The first clue that there is a close relation between the interrogative *u*-construction and relative clauses comes from their morphological shape: relative clauses contain *u*-forms:

(15) a. (u-j)   yàmbaa **j-u** ñu tóx   *u*-Relative
          indef-CM marijuana CM-*u* 3pl smoke
          'some marijuana that they smoked'

     b. **J-u**   ñu tóx   *u*-Interrogative
          CM-*u* 3pl smoke
          'What (*ji*-class item) did they smoke?'

In the "relative" *u*-construction in (15a), an *u*-form, *j-u*, appears on the left edge of the relative clause. In the interrogative *u*-construction in (15b), an *u*-form occurs on the left edge of the wh-question.

    The second common property is that there are relative clause *u*-forms for all noun classes, just as in the interrogative *u*-construction. In relative clauses, the *u*-form obligatorily agrees in class with the immediately preceding nominal, the relativized NP. Thus, *yàmbaa* 'marijuana' in (15a) is in the *ji*-class, while *poon* 'tobacco' in (16) below is in the *mi*-class and occurs with a different *u*-form, *m-u*:

(16) (u-m)   poon **m-u** ñu   tóx   *u*-Relative
         indef-CM tobacco CM-*u* 3pl   smoke
         'some tobacco that they smoked'

---

[8] Space considerations preclude discussion of these constructions here.

The idea that the interrogative *u*-construction is closely related to *u*-relative clauses is further supported by cases like (17). In (17a) the (interrogative) *u*-construction is interpreted as a wh-question. (17b) contains the identical string as the complement of *dimbëli* 'help' and is interpreted as a free relative. As (17c) shows, when an *an*-form occurs with a relative clause, the relative clause is interpreted as modifying the *an*-form, not as a wh-question:

(17) a. **K-u**   ñu dóór[9]   *u*- Interrogative
CM-*u*   3pl hit
'Who did they hit?'

   b. Di-na-a   dimbëli **k-u** ñu dóór   *u*-Free Relative
IMPERF-FIN-1sg   help   CM-*u* 3pl hit
'I will help whoever/someone who they hit'

   c. **k-an** **k-u**   ñu dóór   *an*-Form with Relative Clause
CM-*an* CM-*u*   3pl hit
'who that they hit'
*'Who did they hit?'

Finally, in both *u*-interrogatives and *u*-relatives, subject and non-subject clitics immediately follow the (underlined) *u*-form and precede a DP subject. That is, both involve the same morphological cluster. This characterizes what I will call a "relative" TP:

(18) a. nit   u̲-k̲u̲   **leen-fa** Ayda won   *u*-Relative
person CM-*u*   3pl-LOC Ayda   show
'a person who Ayda showed to them there'

   b. K̲-u̲ **leen-fa** Ayda   won ?   *u*-Interrogative
CM-*u* 3pl-LOC Ayda   show
'Who did Ayda show to them there?'

We have seen that the *u*-interrogatives and *u*-relatives are the same construction. However, *u*-forms are not the only elements that can surface on the left edge of Wolof relative clauses:

(19) a. yàmbaa   **j-i**   ñu tóx   (j-i)   *i*-Relative Clause
marijuana CM-*i* 3pl smoke CM-def.prox
'the marijuana here that they smoked'

   b. yàmbaa   **j-a**   ñu tóx   (j-a)   *a*-Relative Clause
marijuana CM-*a* 3pl smoke CM-def.dist
'the marijuana there that they smoked'

The underlined strings in (19) are composed of a noun class marker followed by *i*-, or *a*-. I refer to the underlined strings in (19) as '*i*-forms', and '*a*-forms', the rationale for which will be clear presently. Comparing the translations in (15a) and (19), it can be seen that the interpretation of the relative clause varies according to whether an *u*-form, *i*-form, or *a*-form occurs on the left edge. When an *u*-form occurs, the head of the relative clause is interpreted as indefinite, as in (15a). When an *i*-form occurs, as in (19a), the head of the relative clause is interpreted as definite and spatially, temporally, or conversationally proximal. (This is indicated in the translation by 'here'.) When an *a*-form occurs on the left edge of a relative clause, as in (19b),

---

[9] As suggested by a reviewer, one difference in (17) that might distinguish between the free relative interpretation and the question interpretation is the presence of a (silent) interrogative force head.

the head of the relative clause is interpreted as definite and distal (spatially, temporally, or in the discourse). (This is indicated in the translation by 'there'.) This is strikingly similar to the interpretations of the *u/i/a* determiner vowels in Table 3 ((8)). I refer to the *u/i/a*-forms collectively as the "relative markers" and I argue in Section 5 that all of them are complementizers.

The *i/a*-forms occur in the same position as the *u*-forms in relative clauses and they agree in class with the immediately preceding relativized noun. As with the *u*-forms in questions and relative clauses, there are *i/a*-forms for all noun classes. Compare the *i/a*-forms that agree with the *mi*-class noun *poon* 'tobacco' in (20) to those in (19) that agree with the *ji*-class *yàmbaa* 'marijuana':

(20) a. poon **m-i** ñu tóx (m-i)   *i*-Relative Clause
         tobacco CM-*i* 3pl smoke CM-def.prox
         'the tobacco here that they smoked'

   b. poon **m-a** ñu tóx (m-a)   *a*-Relative Clause
         tobacco CM-*a* 3pl smoke CM-def.dist
         'the tobacco there that they smoked'

When relative clauses containing *i*-forms or *a*-forms occur in isolation, they are interpreted as free relative clauses, i.e. individual denoting expressions, rather than matrix wh-interrogatives, as shown in (21) below. In this way, they contrast with the *u*-forms, which can be matrix questions or free relatives (as (17a-b) above show).

         Matrix *i*-form
(21) a. **K-i** ñu dóór
         CM-*i* 3pl hit
         'The one here who they hit'   Free Relative
         *'Who here did they hit?'   *Interrogative

         Matrix *a*-form
   b. **K-a** ñu dóór-óón
         CM-*a* 3pl hit-past
         'The one there who they hit'   Free Relative
         *'Who there did they hit ?'   *Interrogative

On the other hand, the *i/a*-forms can introduce embedded wh-interrogatives, as can *u*-forms:

(22) a. Laaj-na-a Ayda [**k-u** ñu dóór]   *u*-Form Interrogative
         ask-FIN-1sg ayda   CM-*u* 3pl hit
         'I asked Ayda who they hit'

   b. Laaj-na-a Ayda [**k-i** ñu dóór]   *i*-Form Interrogative
         ask-FIN-1sg ayda   CM-*i* 3pl hit
         'I asked Ayda who they hit'

   c. Laaj-na-a Ayda [**k-a** ñu dóór]   *a*-Form Interrogative
         ask-FIN-sg ayda   CM-*a* 3pl hit
         'I asked Ayda who they hit'

Thus, although they are quite similar in distribution, the *u*-forms and *i/a*-forms are not identical.

Like the *u*-form in the interrogative *u*-construction and *u*-relative clauses, the *i*-forms and *a*-forms can be immediately followed by the clitic cluster that characterizes a relative TP in (18):

8

(23) a. Nit   k-i   **leen-fa** Ayda won   *i*-Relative Clause
        person CM-*i* 3pl-LOC Ayda show
        'the (proximal) person who Ayda showed to them there'

      b. Nit   k-a   **leen-fa** Ayda won   *a*-Relative Rlause
        person CM-*a* 3pl-LOC Ayda show
        'the (distal) person who Ayda showed to them there'

(24) schematizes the constructions that contain the relative markers:

    (24)   Linear Order in the Relative TP
        a.   CM-**u** Clt_S-Clt_O-Clt_{Loc} S_{DP} V O *u*-Construction
        b. NP CM-**u** Clt_S-Clt_O-Clt_{Loc} S_{DP} V O *u*-Relative Clause
        c. NP CM-**i** Clt_S-Clt_O-Clt_{Loc} S_{DP} V O *i*-Relative Clause
        d. NP CM-**a** Clt_S-Clt_O-Clt_{Loc} S_{DP} V O *a*-Relative Clause

In all of the constructions in (24), the relative markers are immediately followed by the clitic cluster (Subject > Object > Locative). The clitic string is followed by the subject, verb, and object. (24b-d) show that in relative clauses the relative marker (CM-*u/i/a*) is immediately preceded by an overt nominal with which it agrees in class. In (24a), the interrogative *u*-construction, the relative marker displays class agreement, but appears to lack a preceding nominal to agree with.

4.2. Movement in *u*-Interrogatives and *u*-Relatives

In addition to the morphological and syntactic properties shared between the the *u*-construction and relative clauses, both involve movement. Support for this claim comes from the island sensitivity of relativization ((25b)), and the *u*-construction ((25c)).[10] Consider an adjunct (i.e. strong) island below:

        Adjunct Island Relativization
    (25) a. Gis-na-a   Bintë [laata ñu jox   tééré y-i   xale b-i   ]
           see-FIN-1sg binta before 3pl give book CM.pl-def.prox child CM-def.prox
           'I saw Binta before they gave the books to the child'

        Relative Clause
      b. ***Tééré** y-i   ma gis Bintë [laata   ñu jox xale b-i   ___   ]
          book CM.PL 1sg see binta   before 3pl give child CM-def.prox
          'The books that I saw Binta before they gave to the child'

        u-Construction
      c. ***Y-u**   xale b-i   dem [laata Bintë togg-al   Móódu ___][11]
          CM-*u* child CM-def.prox leave before binte cook-BEN moodu
          'What(pl) did the child leave before Binte cooked Moodu?'

---

[10] I exemplify only with a strong island. However, relativization and *u*-construction questions are constrained by strong and weak islands (Torrence 2005).

[11] The overt wh-expressions, the *an*-forms, also exhibit island sensitivity for strong and weak islands:
    (i) ***L-an** l-a   xale b-i   dem [laata Bintë togg-al   Móódu ___]
        CM-*an* xpl-a child CM-def.prox leave before binte cook-ben moodu
   'What did the child leave before Binte cooked Moodu?'

(25b) shows that an NP cannot be relativized out of an island, as expected. (25c) shows that an *u*-form cannot be associated with a gap inside of an island. Thus, the ungrammaticality of (25b-c) indicate that relativization in Wolof and the *u*-construction involve movement of something.

In this section, I have argued for the essential structural unity of relative clauses and the interrogative *u*-construction. The central common property is that the three relative clauses (*u/i/a*-relatives) and the interrogative *u*-construction (and embedded interrogative *i/a*-questions) are introduced by the same sets of left peripheral elements, *u/i/a*-forms, and they occur in the same configurations. In addition, both relative clauses and the interrogative *u*-construction exhibit island sensitivity. This indicates that the interrogative *u*-construction is built from a type of relative clause construction. In order to motivate the existence of silent wh-expressions however, we must first resolve the syntactic status of the relative markers, the goal of the following section.

5. Status of the Relative Markers

This section addresses the categorial status of the relative markers by looking at the predictions made by the analysis I propose. I argue that the interrogative *u*-construction in (26a) is analyzed as (26b):

(26) a. **K-u** Bintë dóór
      CM-*u* binta hit
      'Who did Binta hit?'

b.

Binta hit…e_i
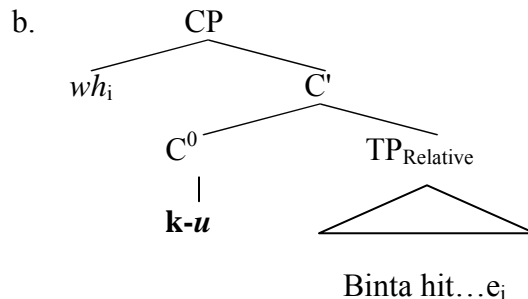
In (26b), the *CM–u* is a C^0 that takes a (relative) TP complement and has a silent wh-word, wh_i, in its specifier. This silent wh-nominal triggers class agreement on C^0, just as ordinary overt nominals do when they are in SpecCP headed by -*u*, such as in *u*-relative clauses. The wh-expression in (26b) is related by movement to a silent category inside of TP, e_i. Note that the *u*-forms occur on the left edge of CP, where complementizers canonically occur in the language. In what follows, I bring further support for my proposal by examining the broader distribution of the relative markers by looking at subordinate clauses, selection, and subordinating conjunctions. It will be seen that the *u*-forms and the other relative markers distribute like complementizers (and unlike wh-expressions), as expected under my analysis in (26b). The evidence for the analysis in (26b) also constitutes evidence against alternative analyses in which the relative markers are wh-expressions or any other kind of nominal.

The first piece of support for the analysis of the relative markers as complementizers comes from examination of subordinate clause constructions with *u*-forms on the left edge. These include *even though* clauses and *instead* clauses:

(27) a. **S-u** fa Ayda gis-óón Dudu sax, nuyu-wu-kó   *even though*
      CM-*u* LOC Ayda see-PAST Dudu even greet-NEG-3sg
      'Even though Ayda saw Dudu there, she did not greet him'

   b. **L-u** fa Ayda gis-gis Dudu, nuyu-wu-kó   *even though*
      CM-*u* LOC Ayda see-see Dudu greet-NEG-3sg
      'Even though Ayda saw Dudu there, she did not greet him'

c. **L-u/*i/*a** mu jaay-e koon kër-ëm, na ko luyé *instead*
   CM-*u/i/a* 3sg sell-*e* COND+PAST house-his OPT 3sg_{OBJ} rent
   'Instead of selling his house, he should rent it'

(27a) has the *u*-form *s-u*, while (27b-c) contain the *u*-form *l-u*. The subordinate clauses in (27) are analytically important for three reasons. First, the underlined clauses with the *u*-forms in (27) do not contain gaps that correspond to any argument or adjunct in the embedded clause. That is, if the *u*-forms in (27) were wh-expressions, they would not be selected by or modifying anything in the clause that contains them, i.e. they would not be licensing an operator-trace configuration. This would be an unexpected property of wh-nominals (Chomsky 1977). Stated differently, there is no clear reason why a wh-expression or any other unselected DP would appear on the left edge of the subordinate clauses in (27). On the other hand, if the *u*-forms are complementizers, then there is no reason for their presence to correlate with argument/adjunct gaps inside of a clause, as they are neither selected by nor modify a clause-internal predicate.

The second important characteristic of the underlined clauses in (27) is that they are not interrogative. This can be seen in two ways. First, the underlined strings in (27) simply cannot be used as matrix wh-interrogatives nor can they occur as the complements of predicates that select for questions, as (28a) shows with *bëgg xam* 'wonder'. Second, if one attempts to use an overt wh-expression, an *an*-form, in the cleft equivalent of (27b) (with the reduplicated verb), the result is ungrammatical, as (28b) shows.

(28) a. *bëgg-na-a xam **l-u** mu jaay-e koon kër-ëm
       want-FIN-1sg know CM-*u* 3sg sell-*e* COND+PAST house-his

   b. ***L-an** l-a fa Ayda gis-gis Dudu, nuyu-wu-kó **even though + l-an*
       CM-*an* XPL-COP LOC Ayda see-see Dudu greet-NEG-3sg_{OBJ}

Identical ungrammaticality results for (27a) and (27c) if one attempts to construct these clauses using *an*-forms (i.e. actual wh-expressions). This pattern follows if the *even though* and *instead* clauses in (27) do not contain wh-expressions, although they contain *u*-forms.

The third analytically useful property can be seen in (27c), which shows that while an *u*-form is fine in the *instead*-clause *i/a*-forms are ungrammatical. Under the analysis I propose, this means that the construction requires a particular complementizer in the left periphery. This conclusion is reinforced by the existence of an alternative *instead* construction in which an *i*-form is used, but not an *u*-form or *a*-form:

(29) **L-i/*u/*a** mu nar-a jaay-e kër-ëm, na ko luye *instead*
     CM-*i/u/a* 3sg should-*a* sell-*e* house-his OPT 3sg_{OBJ} rent
     'Instead of selling his house, he should rent it'

The *instead* construction in (29) contrasts with the *instead* clause in (27c) because the conditional particle *koon* is absent and a modal auxiliary *nar* 'should' is used. Just as with the *u*-form in the *instead* construction in (27c), the *i*-form in (29) does not correspond to any argument or adjunct gap in the clause and the underlined string cannot be used as a question in any context. Crucially, in (29) the *i*-form is grammatical, but the *u/a*-forms are excluded. From the perspective of the proposed analysis, this indicates that different subordinate clause constructions employ different complementizers, which is unsurprising.

Evidence from predicate selection provides a second source of evidence that the relative markers are complementizers. This can be seen by looking at intensional predicates like *bëgg* 'want, like', which can select for at least three different types of clausal complements in Wolof:

(30) a. Bëgg-na-a [Ø mu togg mbuum] Subjunctive Complement
        want-FIN-1sg C 3sg cook mbuum
        'I want her to cook mbuum'

b. Bëgg-na-a   [**na**   togg   mbuum]   Optative Complement
    want-FIN-1sg OPT.3sg cook   mbuum
    'I want that she cook mbuum'

c. Bëgg-na-a   [**l-i/l-a/*l-u**   mu togg   mbuum]   *i/a*-Form Complement
    want-FIN-1sg CM-*i*/CM-*a*/CM-*u* 3sg cook   mbuum
    'I want her to cook mbuum'

The verb *bëgg* 'want' can select for subjunctive ((30a)), optative ((30b)) or *i/a*-form clausal complements ((30c)). The left edge of the embedded clause in (30c) can be introduced by two of the relative markers, the *i*- or *a*-forms. This is once again a case in which the *i/a*-forms do not correspond to any argument or adjunct gap in the clause they introduce. We saw previously (in (22b-c)) that *i*- and *a*-forms can also occur on the left edge of embedded questions. This means that the *i/a*-forms occur on the left edge of questions and non-questions. The presence of *i/a*-forms in (30c) is unexpected if these relative markers are wh-expressions because a predicate like *bëgg* 'want' does not select for questions. If the relative markers are complementizers, it means that embedded questions and certain embedded *non*-questions have common structural positions in the left periphery. (30c) also shows that *u*-forms cannot introduce the embedded relative complement clause. Since the other relative markers are permissible in the same environment, this suggests that there is a selectional relation between *bëgg* 'want' and the relative markers, exactly what one would expect if the relative markers are complementizers. Thus, under the propsed analysis, the verb *bëgg* can select for four different complementizers: $\varnothing_{SUBJUNC}$, na_{OPT}, *l-i*, or *l-a*.

    The analysis that I argue for receives still further support from the existence of a set of subordinating 'conjunctions' that contain relative markers (obligatorily or optionally) and 'subordinators'. These include *after*-clauses, *no matter*-concessive conditionals, *until*-clauses, and *even if*-clauses. Here, I exemplify the pattern using only *even if*-clauses.

    Even if clauses contain the subordinator *doonte* and an *u/i/a*-clause:

(31) a. Doonte **b-u**   leen Ayda gis-éé,   d-u   leen nuyu
     even.if CM-*u* 3pl Ayda see-perf   IMPERF-NEG 3pl   greet
     'Even if Ayda sees them, she won't greet them'

b. Doonte **b-i**   leen Ayda gis-éé,   d-u   leen nuyu
     even.if CM-*u* 3pl Ayda see-perf IMPERF-NEG 3pl   greet
     'Even if Ayda saw them, she wouldn't have greeted them'

c. Doonte **b-a** leen Ayda daan   gis,   daan-ul   leen nuyu
     even.if CM-*a* 3pl Ayda PAST.HAB see   PAST.HAB-NEG 3pl   greet
     'Even if Ayda used to see them, she wouldn't greet them'

In (31a-c), the subordinator is immediately followed by the relative markers. Recall that in headed relative clauses, the presence of *CM-i/u/a* on the left edge of the clause corresponds to different interpretations of the relative clause. In *even if*-clauses too, the interpretation varies according to whether an *i*-form, *u*-form, or *a*-form occurs, as indicated in the translations. Just as with relative clauses and the interrogative *u*-construction, the *even if*-clauses in (31) contain relative TPs because the non-subject clitics immediately follow the relative marker and precede the DP subject. As in the cases discussed previously, the relative markers in (31) do not correspond to an argument or adjunct gap in the clause and are not selected by a clause-internal predicate. This follows if the relative markers are not wh-expressions (or any other type of nominal). Under the proposed analysis, the relative markers are complementizers selected by the subordinator *doonte*. Thus, there is no expectation that they need be associated with a gap in the clause.

The idea that a subordinator like *doonte* takes the relative markers as complements is supported by the fact that there exists an alternative *even if* construction in which the subordinator takes a subjunctive-like complement; therefore, the relative markers do not appear. In this case, the verb precedes the non-subject clitics:

(32) **doonte** Ayda gis-léén   *doonte* + subjunctive
     even.if Ayda see-3pl
     'Even if Ayda sees them'

(32) shows that *doonte* by itself has the meaning "even if". The cases in (31) contrast with that in (32) in showing that the size of the complement of *doonte* may vary (TP or CP). In light of my proposed analysis, (31a-c) are cases in which a non-verbal element selects for an *u/i/a*-form, a C^0.

Taking the relative markers as complementizers, additional distributional properties of the *u*-forms can be made sense of. Recall that the relative markers, including the *u*-form in the interrogative *u*-construction, only occur with a relative TP:

(33) a. **K-u**   ngeen-leen-fa togg-al?   *u*-Construction
      CM-*u* 2pl-3pl-loc   cook- BEN
      'Who did y'all cook them for there"

   b. Gis-na-a   nit   **k-u/i/a**   ngeen-leen-fa togg-al   *u/i/a*-Relative
      see-*na*-1sg person CM-*u/i/a* 2pl-3pl-loc   cook-BEN
      'I saw a/the person who y'all cooked them for there'

If the relative markers are complementizers, the correspondence between C and TP follows from the selectional properties of C. A complementizer selects for a particular type of TP. In the cases in (33), the relative markers select for relative TPs.

The proposed analysis also finds support from the fact that only one *u*-form per clause is allowed. In contrast, multiple *an*-forms may co-occur in a single clause:

(34)   *CM-u…CM-u*
   a. ***K-u**   **l-u**   jox-oon xale   y-i[12]
      CM-*u* CM-*u* give-past child CM.pl-def.prox
      Intended: 'Who gave what to the children?'

     CM-an…CM-an
   b. **K-an l-an**   l-a   jox-oon xale   y-i
      CM-*an* CM-*an* xpl-*a* give-past child CM.pl-def.prox
      'As for who, what is it that he gave to the children?'   Echo only

The ungrammaticality of (34a) is predicted by my analysis. The *u*-forms are complementizers and select for a TP. Only one *u*-form per clause is permissible because a case like (34a) would require that an *u*-form select for a CP headed by another *u*-form. While the multiple *an*-forms in (34b) give rise to an echo question, they contrast with the multiple *u*-forms in (34a), which is ungrammatical.

Finally, the *u*-forms always occur to the left of TP. That is, they are never inside of TP or in situ, as (35b) shows. In this, the *u*-forms contrast with the *an*-forms, which can occur in situ in TP ((35a)):

---

[12] Reversing the order of the *u*-forms does not change the ungrammaticality of (34a).

(35) a. Xale y-i   togg-al-na-ñu   Isaa **l-an**   *an*-Form in-situ
       child CM.pl-def.prox cook-BEN-FIN-3pl   isaa CM-*an*
       'The kids cooked what for Isaa?'   (echo only)

   b. *Xale y-i   togg-al-na-ñu   Isaa **l-u**   **u*-Form in-situ
       child CM.pl-def.prox cook-BEN -FIN-3pl isaa CM-*u*
       Intended: 'The kids cooked what for Isaa?'

While (35a) is a grammatical echo question, (35b) is simply impossible. This pattern too follows from the proposed analysis. As complementizers, it is expected that the *u*-forms cannot occur inside of TP because they are not selected by anything inside of TP. The left edge of the clause is where C's ordinarily occur in the language and where they are subject to selection by external predicates.

The analysis in (36), which treats the relative markers as C^0's, accounts for three global distributional properties of the *u*-forms:

(36)

```
              CP
             /  \
                 C′
                /  \
      CM-u/i/a      TP_Rel
```
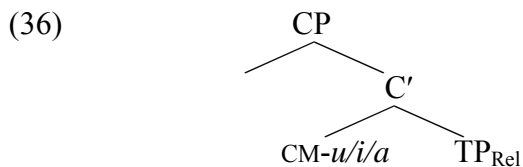
First, I have shown that there is a dissociation between the presence of the relative markers and wh-questions. That is, the relative markers appear in questions and non-questions. At the same time, there is a dissociation between the presence of relative markers and the presence of an argument/adjunct gap in a clause. This means that the relative markers occur in clauses with gaps (e.g. wh-questions) and they occur in clauses without gaps (e.g. clausal complements of *bëgg* 'want' and *instead* clauses). Put differently, we have seen that Wolof has a set of constructions that share left peripheral substructures, namely the relative markers. Some of these constructions involve an operator-variable dependency, such as relative clauses. For others, such as *instead*-clauses, there is no reason to think that an operator-variable dependency is involved. In this way, the Wolof relative markers are similar to the English complementizer *that*, which occurs in constructions with operator-variable dependencies like relative clauses (*the beard **that** Leston admired*) and those that do not involve operator-variable dependencies (*I think **that** Jason tasted the Japanese honey*). With the relative markers taken as complementizers in (36), there need not be any association between the presence of the relative markers and a gap in a clause. In a wh-question, the relative markers occur with a TP-internal gap because there is a wh-expression somewhere in the clause that corresponds to the gap. The relative marker is not itself the wh-expression. Second, (36) encodes the fact that the relative markers are subject to selection by external predicates including verbs and subordinators. As heads in the left periphery, the relative markers are expected to be directly selectable by external predicates, which is what we have seen. Finally, there is a one-to-one correspondence between the relative markers and a particular type of TP (a relative TP). In (36), the complementizer determines the TP type because it selects for a TP. In other words, relative markers can be selected externally, but at the same time determine the internal TP type of the clause that they introduce. These are relations ordinarily mediated by complementizers. Given this constellation of properties, I conclude that the relative markers, *u*-forms, *i*-forms, and *a*-forms, are complementizers. In the following sections, the consequences of my analysis for the interrogative *u*-construction are fleshed out.
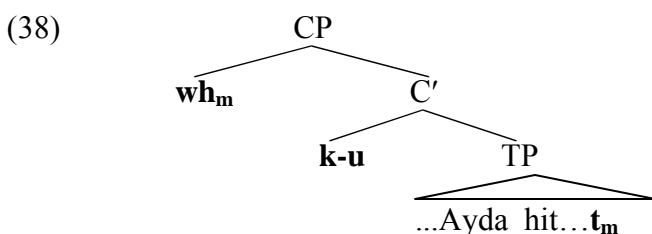
6.   Silent Wh-Expressions in Wolof
6.1. The Existence of Null Wh-Expressions in Wolof

In this section, I motivate the existence of silent wh-expressions in Wolof and discuss the properties of these wh's. I show that the silent wh-expressions in Wolof are paralleled by the existence of other silent elements that surface in similar syntactic configurations. Specifically, I examine silent nouns of time. I then compare the Wolof silent wh's to silent wh/operator constructions in German and Dutch.
    Consider the wh-question from (1) repeated below:

(37) K-u   Ayda dóór ?   (= (1))
       CM-*u* Ayda   hit
       'Who did Ayda hit?'

We have argued that the *u*-form on the left edge of the clause in (37), *k-u*, is not a wh-expression. The only other overt material in the clause is the subject *xale bi* 'the child' and the verb *dóór* 'hit'.   However, as (37) is interpreted as a constituent question, it must contain a wh-expression/operator. I argue that the interrogative *u*-construction like (37) contains a silent wh -expression, wh_m in (38) below:

(38)   CP
                   ┌─────────┴─────────┐
              wh_m   C′
                            ┌────────┴────────┐
                         k-u   TP
                                    ┌────────┴────────┐
                                   ...Ayda hit…**t_m**

In (38), the silent wh-expression surfaces in the specifier of the *u*-form, SpecCP, where it triggers class agreement on C, spelled out as the noun class marker *k-*. Recall that in headed relative clauses the relative markers agree with the relativized nominal. In terms of my proposal, this means that the complementizer *-u* agrees in class with the nominal in its specifier in both the interrogative *u*-construction and relative clauses. The presence of island sensitivity ((25)) in the interrogative *u*-construction confirms that the construction involves movement of the silent wh-expression and not base generation in SpecCP. The conclusion from cases like (37) (and (38)) is that Wolof possesses a silent form of *who* that belongs to the (singular human) *ki*-class and undergoes obligatory wh-movement to the specifier of the CP headed by the *u*-form.
    The idea that Wolof possesses silent wh-nominals that trigger agreement on C is supported by observations of the behavior of "temporal" nouns and temporal clauses. As we will see below, these two constructions strongly corroborate the conclusion that Wolof has null wh-expressions.
    Temporal nouns are nouns of time such as *minute*, *hour*, and *day*. When temporal nouns are relativized (in perfective contexts), the perfective marker *–ee* obligatorily appears as a suffix on V ((39)). [13]   (I exemplify only with *i*-forms, but *u*-forms and *a*-forms pattern identically.) Relativization of temporal nouns therefore contrasts with that of non-temporal nouns, where the verb cannot take the *–ee* suffix in a relative clause ((39d)):

(39) a. **bés** **b-i**   më-kó   gis-*(**éé**)   ✓*bi*-class temporal noun + *-ee*
            day   CM-*i* 1sg-3sg_obj see-PERF
            'the day that I saw him'

---

[13] Church 1981 makes this observation.

b. **saa** <u>**s-i**</u> ma-ko gis-*(**éé**)   ✓ *si*-class temporal noun + *-ee*
  moment CM-*i* 1sg-3sg~obj~ see-PERF
  'the moment that I saw him'

c. **waxtu** <u>**w-i**</u> ma-ko gis-*(**éé**)   ✓ *wi*-class temporal noun + *-ee*
  time CM-*i* 1sg-3sg~obj~ see-PERF
  'the time that I saw him'

d. **xaj b-i** ma gis-(***ee**)   *bi-class non-temporal noun + *-ee*
  dog CM-*i* 1sg see-PERF
  'the dog that I saw'

Crucially, as in run-of-the-mill relative clauses, the (underlined) relative markers (i.e. complementizers) in (39a-c) agree in class with the relativized temporal noun.
     Temporal clauses in Wolof are relevant to the discussion because they contain *u*-forms, *i*-forms, and *a*-forms from the *bi*-class, *si*-class, and the *fi*-class. The first type of temporal clause is introduced by relative markers that display *bi*-class agreement:

(40) a. **B-u** ñu lekk-ee ceeb   *u*-Form Temporal
  CM-*u* 3pl eat-PERF rice
  'when they eat rice'

b. **B-i** ñu lekk-ee ceeb   *i*-Form Temporal
  CM-*i* 3pl eat-PERF rice
  'when they ate rice'

c. **B-a** ñu daan lekk ceeb   *a*-Form Temporal
  CM-*a* 3pl PAST.HAB eat rice
  'when they used to eat rice'

Just as with headed relative clauses, the interpretation of a temporal clause itself varies according to which relative marker is present. When an *u*-form occurs on the left edge, as in (40a), the temporal clause refers to a habitual or future event. When an *i*-form occurs, the temporal clause refers to a situation in the (near) past, as in (40b). When an *a*-form occurs on the left edge of a temporal clause, it refers to a situation in the distant and/or habitual past that no longer continues into the present ((40c)). The verb in (perfective) temporal clauses carries the perfective *–ee* suffix, as in (40a-b).
     The second type of temporal clause has an *u*-form with a *si*-class marker:

(41) **S-u** ñu lekk-ee ceeb   *u*-Form Temporal
  CM-*u* 3pl eat-PERF rice
  'when they eat rice'

The third type of temporal clause is introduced by relative markers that show (locative) *fi*-class agreement:

(42) a. **F-u** ma gis-éé Isaa   *u*-Form Temporal
  CM-*u* 1sg see-PERF isaa
  'when I see Isaa'

b. **F-i** ma gis-(éé) Isaa   *i*-Form Temporal
  CM-*i* 1sg see-PERF isaa
  'when I saw Isaa'

c. **F-a**   ma gis- éé   Isaa   *a*-Form Temporal
    CM-*a* 1sg see-PERF isaa
    'when I saw Isaa'

It is important to note that the English translations of (40a-c), (41), and (42a-c), which contain the wh-word *when*, do not literally reflect the Wolof. This is because none of the strings in (40), (41), or (42) can be used to form matrix or embedded *when* wh-questions. That is, neither *b-u/i/a* nor *s-u*, nor *f-u/i/a* can correspond to 'when' interrogatives.[14] (The independent wh-word *kañ* 'when' is used.) This fact can be made sense of if temporal clauses, all of which contain *u/i/a*-forms, do not contain interrogative wh-items. The connection to temporal nouns can now be seen. Putting together the data in (39) and (40)-(42), the difference between temporal clauses and the relativized temporal nouns is simple. Temporal clauses contain the perfective suffix because a temporal noun has undergone A′-extraction. This is what happens when an overt temporal noun is relativized ((39a-c)). In temporal clauses however, the A′-extracted nominal is unpronounced. The fact that temporal clauses display noun class agreements for three different noun classes (*bi-*/*si-*/*fi-*classes) follows if the silent temporal nouns belong to three different noun classes. That is, both overt and silent temporal nouns trigger class agreement on the *u*-form, *i*-form, or *a*-form, exactly as in ordinary relative clauses. Thus, the *u/i/a*-forms are left peripheral elements, i.e. complementizers, that agree with A′-extracted nominals, which may be overt or null. In the interrogative *u*-construction, the nominal that triggers agreement on C is a silent wh-expression.

The analysis in (38) implies that the silent wh-expression in SpecCP determines the surface shape of the *u*-form. The descriptive generalization for relative clauses and relativized temporal nouns is straightforward: the relative markers always agree in class with an immediately preceding relativized nominal, as in (43a-b) respectively.

(43)

a. [[xale]ₖ **b-u** ma dàq **tₖ**]   b. [[bés]ₖ **b-u** ma ko dàq-ee **tₖ**]
    child   CM-*u* 1sg chase   day   CM-*u* 1sg 3sg chase-PERF
    'child that I chased'   'day that I chase him'

In the temporal clause in (44a) and interrogative *u*-construction in (44b) though, we find the same agreeing complementizers, but no overt nominals:

(44)

a. [[*NP* ₍bi-class₎]ₖ **b-u** ma ko dàq-ee **tₖ**]   b. [[*What₍bi-class₎*]ₖ **b-u** ma dàq **tₖ**]
    NP₍Temporal₎ CM-*u* 1sg 3sg chase-PERF   NP₍wh₎   CM-*u* 1sg chase
    'when I chase him'   'What (*bi*-class item) did I chase?'

The patterns of agreement across constructions are schematized as in Table 4:

---

[14] For most speakers that I have worked with, there is in fact no *u*-form that can be used to ask a 'when' question. However, for some Dakar speakers, it is possible to form a *when* question with a *b-u* clause. Note that this is not possible for the speakers consulted for this paper:

(i) %**B-u** ñu y   dem?   Dakar variety
    CM-*u* 1pl IMPERF leave
    'When will we leave?'

(45)   Table 4 Agreement Configurations in Relative-like Constructions

Construction	Nominal Type	Agr	C	TP	Example
Headed RC	Overt NP	b	u	ma dàq	(43a)
Temporal RC	Overt (temporal) NP	b	u	ma dàq-ee	(43b)
Temporal CP	Null (temporal) NP	b	u	ma dàq-ee	(44a)
u-Construction	Null Wh	b	u	ma dàq	(44b)

The positing of null wh-expressions has the positive consequence that the morpho-syntax of agreement for overt nouns in headed relative clauses ((43a)) and relativized temporal nouns ((43b)) now falls together with the agreement mechanism for silent nouns in temporal clauses ((44a)) and silent wh-expressions in the *u*-construction ((44b)). All of these involve spec-head agreement (and A′-extraction).

It was noted previously that there are *u*-forms for all of the noun classes. Given my analysis, this means that Wolof has silent wh-expressions for each noun class. As with ordinary nouns in *u*-relative clauses, the silent wh-word triggers obligatory class agreement on -*u*- in the interrogative *u*-construction.[15] One question that arises is whether Wolof actually has silent wh-expressions for each noun class or whether there is a general null wh-expression, whose class (and basic semantic content) can be identified from the discourse context (as suggested by a reviewer). This does not seem plausible for Wolof because it was shown earlier ((14)) that the interrogative *u*-construction (and therefore the null wh-expresssions that occur with the *u*-forms) and overt *an*-forms are used in out-of-the-blue contexts in which there is no previously established noun (or noun class) in the context. In that case, there is nothing in the discourse for the null wh-expression to be agreeing with or referring back to. Thus, both null and overt wh-expressions pattern the same. Nonetheless, the interpretation or identification of the silent wh-word *is* tied to the noun class agreement on the C^0 that it occurs with. As noted, the default singular human noun class is the *ki*-class. If an *u*-form with *ki*-class agreement is used (i.e. *k-u*) the silent wh that triggers such agreement can only range over single humans. Similarly, the *li*-class is the default singular non-human ('thing') class. When an *u*-form occurs out-of-the-blue that corresponds to the *li*-class, the silent wh-word that triggers the class agreement on -*u*- ranges over singular 'things', not people, places, manners, etc. The same considerations apply to the manner/means *ni*-class, which contains no overt nouns at all. All of the demonstratives, articles, etc. with *ni*-class agreement relate to manners/means: *nii* 'this way', *nale* 'that way', *noonule* 'that (previously mentioned) way', etc. When the *u*-form corresponding to the *ni*-class (i.e. *n-u*) is used, it means that the silent wh-expression must be drawn from the *ni*-class. In this case, the speaker can only be asking about a manner/means. This is because the wh-words of the *ni*-class, both silent and overt, can only range over manners/means. The point is that this is exactly what one finds with all of the *overt* wh-expressions. When an *an*-form from the *ki*-class, *k-an*, is used, it can only correspond to (singular) English 'who'. When an *an*-form from the *ni*-class, *n-an* is used, it is used to question the means or manner. Overt wh-expressions are identified by the presence of a noun class marker on the wh itself. Null wh-expressions are identified by the noun class agreement that they trigger on C.

Having established the existence of null wh-expressions in Wolof, we can now examine their syntactic properties and compare them to the properties of overt wh-expressions. In Section 4.2 ((25b-c)), I showed that the *u*-construction is island sensitive. This means that null wh-expressions, just like the overt *an*-forms, cannot escape strong islands. This is what we would expect of wh-expressions and wh-movement.

A Wolof-internal contrast between the overt and null wh's is that the null wh-expressions always undergo overt movement to SpecCP and always surface in the specifier of an agreeing C^0 (one of the relative markers). Consider the following contrast in multiple wh-questions:

---

[15] Dunigan (1994) takes the *u*-construction to contain a silent wh-operator and –*u*- to belong to the 'Σ' category, which takes TP as its complement. It is thus very similar to the one presented here. She discusses her analysis on pages 137-139.

(46) a. ***K-u** dàq Ø   =   [$_{CP}$ [$wh_{ki\text{-}class}$] **k-u** dàq [$wh_{li\text{-}class}$]
CM-*u* chase   NP$_{wh}$ CM-*u* chase NP$_{wh}$
Intended: 'Who chased what?'

   b. **K-an** mu a dàq **l-an**
CM-*an* 3sg *a* chase CM-*an*
'Who chased what?'

(46a) would be grammatical if the silent wh-expression in object position, $wh_{li\text{-}class}$, could remain in situ. In contrast, the overt wh-expression *l-an* 'what' in (46b) need not occur in SpecCP. This entails that multiple overt wh-expressions (i.e. *an*-forms) can co-occur in a single clause, but not multiple null wh-expressions.[16]

6.2 Wolof Silent Wh's in the Cross-Linguistic Context

This section further elucidates the properties of Wolof null wh's by comparing them to operators in other languages. Specifically, I look at null operators in German, dropped wh's in Dutch, and wh-expressions in Japanese.

Based on (46), I argued that the null wh's in Wolof obligatorily move to SpecCP. The requirement that null operators surface in SpecCP is not a quirk of Wolof. This property is shared by Wolof null wh's and null subject and object operators in (colloquial) German, as analyzed in Cardinaletti (1994):[17]

German
(47) a. Habe ich gestern   gekauft[18]   Null Object
have   I   yesterday bought
'I bought it yesterday'

   b. Habe es gestern   gekauft   Null Subject
have it yesterday bought
'I bought it yesterday'

Given that German displays V2 in matrix clauses, the fact that the finite verb is the first pronounced string in (47a-b) suggests that something is in SpecCP. Cardinaletti argues that the null object construction like (47a) involves two silent categories: a null operator in SpecCP and a clause-internal null pronominal in argument position. Under Cardinaletti's analysis, (47a) is analyzed as in (48a) below with a base generated operator in SpecCP binding the silent pronominal. Null subjects like (47b) however are argued to involve generation of a silent pronominal, *pro*, in an argument position, followed by raising of *pro* to SpecCP, from which it binds its trace, as in (48b):

(48) a. [$_{CP}$ **Op$_i$** [$_{AgrP}$ ich gestern   **pro$_i$** gekauft habe]][19]   (= (47a))
I   yesterday   bought have
   b. [$_{CP}$ **pro$_i$** [habe **t$_i$** es gestern   gekauft]]   (= (47b))
have   it yesterday bought

---

[16] A null wh can occur in a multiple wh-question as long as the other wh's are overt wh-expressions and can remain in situ:
  (i) **K-u**   lekk <u>l-an</u>   <u>kañ</u>   =   [$_{CP}$ [$Wh_{ki\text{-}class}$] **k-u** eat what when]
CM-*u*   eat   CM-*an*   when
'Who ate what when?'
[17] Thanks to Marcel den Dikken for pointing me to Cardinaletti's work and the case of wh-drop in Dutch.
[18] Idiomatic translations into Italian are not given in Cardinaletti (1994). Translations into English are mine. (47a) and (47b) are adapted from Cardinaletti 1994, page 207, #17 and page 227, #59a respectively.
[19] Adapted from Cardinaletti (1994, page 212, #32a).

I set aside systematic comparison of the Wolof and German constructions here. What is of interest is that in both languages the presence of null elements involves SpecCP: either movement to it or base generation in it. That is, the fact that the *null* whs must overtly move to SpecCP does not seem to be a peculiarity of Wolof.

Wolof is not the only language claimed to possess silent wh-expressions. The Wolof *u*-construction is reminiscent of the unpronounced wh-expressions in the phenomenon of 'wh-drop' found in (some dialects/speakers of) Dutch. Den Dikken (2006) observes that *wat* 'what' is droppable in cases like (49a) below. Note that it is unclear whether the Dutch case involves a null wh or represents a type of ellipsis. However, like the Wolof *u*-construction, wh-drop is possible in out-of-the-blue contexts:

(49) a. (Wat)   heb je nou gedaan[20]   *what*-drop
       what have you now done
       'What have you done now?'

    b. *~~Wie~~ heeft het boek nou gelezen   *who*-drop
       who has the book   now read

    c. %~~Waar~~ heb je het boek nou gelegd?   *where*-drop
       where have you the book now put
       'Where have you now put the book?'

One immediately observable difference between Wolof and Dutch is the lack of agreement with the dropped wh in Dutch. Given that Dutch (like German) displays V2 word order in matrix clauses, the grammaticality of (49a) suggests that the dropped wh undergoes movement to SpecCP, like the null wh's in Wolof. Another difference between the null wh's in Wolof and the dropped wh's in Dutch concerns the inventory of unpronounced wh-expressions. For speakers that allow wh-drop, only a very restricted set of wh-expressions can be dropped in Dutch. As indicated by the strikethrough, *wie* 'who' in (49b) is not droppable and in (49c) *waar* 'where' is droppable for some speakers (although it is judged to be less than perfect). This is quite different from Wolof where there exist silent versions of 'who', 'what', 'how', 'where', etc. The presence of noun class agreement on C in Wolof is the central property that allows the identification of which null wh-expression is present. Presumably, lack of this property contributes to the restricted nature of wh-drop. In addition, all of the speakers I have consulted agree that wh-drop is not possible in an embedded SpecCP:

    Dutch
(50) Ik vraag me af *(**wat**) je   nou   gedaan hebt /hebt gedaan
     I   ask   me if   what you now done   have/have done
     'I wonder what you have now done'

Dutch wh-drop in embedded clauses is informative because it shows that occurrence in SpecCP is a necessary but not sufficient licensing condition on null/dropped operators, at least in the small sample examined here.[21] Wolof may be unusual in possessing an entire set of null wh-expressions. However, these null wh's share a number of properties with null and overt wh-operators in other languages.

---

[20] Thanks to Hilda Koopman, Allard Jongman, Pepijn Hendriks, Tamara Mewe, and Wouter van Wingerden for Dutch judgements and information on the context of use.
[21] See also Svenonius and Kennedy (2006). They argue that some Northern Norwegian dialects possess a null wh-degree operator that undergoes obligatory movement to the C-domain.

A further consequence of the analysis is that the Wolof silent wh-expressions appear in both interrogative and non-interrogative contexts, such as free relative clauses, as noted previously:

(51) Dàq-na-a   [[*Who$_{ki\text{-}class}$*] **k-u** ñu dóór]   Null Wh-Free Relative
    chase-FIN-1sg   NP$_{wh}$ CM-*u* 3pl hit
    'I chased someone that they hit'

This makes the null wh-expressions different from the overt *an*-forms, which only appear in interrogatives, in contrast to (51):

(52) *Dàq-na-a   **k-an**   l-a-ñu   dóór
    chase-FIN-1sg CM-*an* XPL-*a*-3pl hit
    Intended: 'I chased who they hit'

(52) is the *an*-form equivalent of (51). This behavior of the null wh's makes them look strikingly similar to wh-expressions found in languages like Japanese (as suggested by Ivano Caponigro), where wh-expressions appear in wh-questions and in indefinite pronouns (Nishigauchi 1990, Haspelmath 1997, Kratzer and Shimoyama 2002):

(53) Japanese[22]
    dare   'who'   **nani**   'what'
    dare-*mo*   'everyone'   **nani**-*mo*   'everything'
    dare-*ka*   'someone'   **nani**-*ka*   'something'
    dare-*demo* 'anyone (free choice)' **nani**-*demo* 'anything (free choice)'

In the Japanese paradigm, the indefinites/quantifiers are composed of the basic wh-expression plus a suffix. One complication in comparing the Wolof and Japanese forms is that the null wh's in Wolof only surface in SpecCP, as we have seen. Instead Wolof null wh's occur in relative clause-like constructions that correspond to various quantifiers or indefinites in English:

(54) a. f-u   nekk 'everywhere'   b. f-u   a   mën-ti dem 'no matter where you go'
      CM-*u* exist   CM-*u* 2sg can-? go

          ⇕   ⇕

    [$_{CP}$ [wh$_{fi\text{-}class}$] **f-u** exist]   [$_{CP}$ [wh$_{fi\text{-}class}$] **f-u** 2sg can-? go]

In the analyses in (54), the null wh's are in SpecCP. However, the clauses are interpreted as a type of indefinite relative clause. The point in discussing these facts is only to establish that that there is a tight connection between the null whs and indefiniteness and that this is a property shared with other languages. (I have not systematically investigated the semantics of the null wh's and therefore must leave detailed analysis of this topic for future research.)

7. Agreement and Successive Cyclicity in the *u*-Construction

In this section, I compare the complementizer agreement properties of the null and overt wh-expressions in Wolof. The analysis of the *u*-forms as complementizers coupled with the idea that Wolof has null wh-expressions yields insight into other distributional properties of both the *u*-forms (complementizers) and wh-expressions (null and overt) in Wolof. The *u*-forms occur in a configuration which I refer to as an "*u*-chain", which is of two types. A "simple" *u*-chain consists of multiple *u*-forms spread over multiple clauses, one per clause:

---

[22] Based on Haspelmath (1997, page 311).

(55)   Simple *u*-Chain

    a. **K-u**   Isaa foog [**k-u**   a   bëgg]
       CM-*u* isaa think CM-*u* 2sg love
       'Who does Isaa think that you love?'

    b. **F-u** Isaa wax ne [**f-u**-ma   jàng-e   taalif y-a]
       CM-*u* isaa say FRC CM-*u*-1sg read-loc poem CM.pl-def.dist
       'Where did Isaa say that I read the poems?'

    c. [CP **F-u** a   defe [CP **f-u**   Maryam wax [CP **f-u**   ñu teg tééré b-i]]]
       CM-*u* 2sg think   CM-*u* maryam say   CM-*u* 3pl put book CM-def.prox
       'Where do you think Maryam said they put the book?'

Simple *u*-chains contain no overt wh-expressions and are interpreted as single wh-questions. Therefore, simple *u*-chains involve the null wh-expressions.

    The second type of *u*-chain, a "mixed" *u*-chain, consists of an *an*-form obligatorily in the highest position, and *u*-forms lower down:

(56)   Mixed *u*-Chain

    a. **Ñ-an** l-a-nu   gëm   ne [**ñ-u**   Isaa bëgg]   Direct Object
       CM-*an* xpl-*a*-1pl believe FRC   CM-*u* isaa love
       'Who(pl) do we believe that Isaa loves?'

    b. **K-an** ngeen   defe ne [**k-u** ñu togg-al]   Benefactive Object
       CM-*an* xpl+*a*+2pl think FRC CM-*u* 3pl cook-BEN
       'Who do y'all think that they cooked for yesterday?'

Both types of *u*-chains can involve any argument or adjunct and can be formed on any noun class.[23] As (55c) suggests, *u*-chain formation is unbounded.

    The existence of *u*-chains is important because, as complementizers, the *u*-forms are expected to be iterable across clauses. Given my analysis and the existence of null wh's, (55a) is analyzed as:

(57)   CP$_2$ (= (55a))

_____
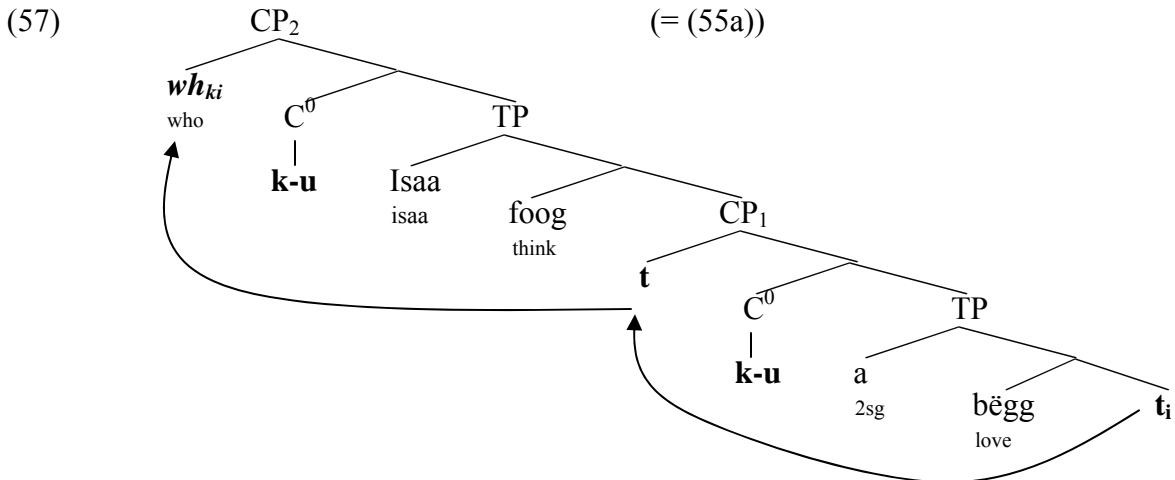
[23] The analog of *u*-chains is also available in relative clauses for *u/i/a*-forms, although I exemplify here only with an *i*-chain:
(i) ?tééré [**b-i**   nga wax [CP **b-i**   xale y-i   sàcc]]   *i*-Chain
   book   CM-*i* 2sg say   CM-*i* child CM.pl-def.prox steal
   'the book that you said the children stole'
This further strengthens the link between relative clauses and the interrogative *u*-construction.

That multiple complementizer agreement is possible indicates that the movement of wh-expressions, both null and overt, is successive cyclic. In (57), the null wh-expression, wh_{ki}, originates as the object of the verb *bëgg* 'love' and raises to the lowest SpecCP, $SpecCP_1$. This movement puts the silent wh-word and C_1^0 in a spec-head configuration. The morphological reflex of the spec-head agreement relation is the noun class marker that precedes the C^0, *k-* in (57). Thus, the noun class agreement on the embedded complementizers signals the presence of a silent wh-word in the embedded SpecCP at some point in the derivation.[24] The iteration of the *u*-forms in *u*-chains therefore follows from successive cyclic movement of the silent wh-word through the embedded SpecCPs.[25]

The mixed *u*-chains are derived like the simple *u*-chains, namely, by successive cyclic movement of the *an*-form through the lower SpecCP positions. Along the way, the *an*-form triggers agreement on the *u*-forms:

(58) [CleftP [**ñ-an**]$_k$ [l-a-ñu   gëm   [FRCP ne [CP t$_k$ [C′ **ñ-u** [TP Isaa bëgg t$_k$]]]]]]
        CM-*an* xpl-*a*-3pl believe   that   CM-*u*   isaa love
        'Who(pl.) do they believe that Isaa loves?'   (= (56a))

While it is possible to form *u*-chains with both the silent and overt wh-expressions, the formation of *u*-chains is not the only option when extracting from embedded clauses. This can be seen from examining other patterns of agreement. We focus first on the null wh's. When extracting from embedded clauses, there are four grammatical patterns of C-agreement:

(59) C-Agreement Patterns
    a. [**K-u** Kumba wax [ne **k-u** Isaa defe [ne **k-u** Maryam di dóór ___]]]
        CM-*u* kumba   say   FRC CM-*u* isaa think   FRC CM-*u* maryam IMP hit
        'Who did Kumba say that Isaa thought that Maryam will hit?'

    b. [**K-u** Kumba wax [ne **l-a**   Isaa defe [ne **l-a**   Maryam di   dóór ___]]]
        CM-*u* kumba   say   FRC xpl-*a* isaa   think   FRC xpl-*a* maryam IMP hit
        'What did Kumba say that Isaa thought that Maryam will hit?'

    c. [**K-u** Kumba wax [ne **l-a**   Isaa defe [ne **k-u**   Maryam di   dóór ___]]]
        CM-*u* kumba   say   FRC xpl-*a* isaa think FRC CM-*u*   maryam IMP hit
        'Who did Kumba say that Isaa thought that Maryam will hit?'

    d. [**K-u** Kumba wax [ne **k-u** Isaa defe ne **l-a**   Maryam di   dóór ___]]]
        CM-*u* kumba   say   FRC CM-*u* isaa   think FRC xpl-*a* maryam   IMP hit
        'Who did Kumba say that Isaa thought that Maryam will hit?'

---

[24] I discuss the agreement in terms of movement through SpecCP, however another implementation is possible. Rackowski and Richards (2005) and den Dikken (2010) argue that wh-movement proceeds from an embedded clause through the matrix Spec*v*P, not SpecCP of the embedded clause. Under this implementation, the agreeing C establishes and AGREE relation with the (null or overt) wh-expression in its base position. This is manifested as complementizer agreement. The wh-expression then moves to Spec*v*P of the matrix clause, bypassing the embedded SpecCP. Thus, there is C-agreement without movement through SpecCP. Under this view, successive cyclicity is preserved as successive cyclic movement through Spec*v*P. Thanks to Marcel den Dikken for suggesting this alternative.

[25] Interestingly, there is a split in Dutch among speakers that allow wh-drop with respect to extraction from embedded clauses:
(i) %~~Wat~~ denkt Marie dat je   nou hebt gedaan?
      what thinks marie that you now have done
      'What does Marie think that you have done now?'
(i) is an instance where *wat* orginates in an embedded clause. That (i) is ungrammatical for some speakers would follow if the the dropped wh cannot undergo successive cyclic movement for some speakers.

e. *[__ **L-a** Kumba wax [ne **k-u** Isaa defe [ne **l-a** Maryam di dóór __]]]
    xpl-*a* kumba say   FRC CM-*u* isaa think   FRC xpl-*a* maryam IMP hit
    Intended: 'Who did Kumba say that Isaa thought that Maryam will hit?'

In (59a), the silent wh-word in the highest SpecCP occurs with agreeing complementizers in the intermediate and most embedded clause. In (59b), only the highest C agrees with the silent wh. The lower clauses do not show agreement. Instead, they are (non-subject) clefts, as indicated by the *l-a* (expletive + *a*) string. In (59c), the highest and lowest C's agree, while there is no agreement in the intermediate clause. (59d) shows that it is possible for the clause containing the extraction site to lack agreement, while the higher clauses display agreeing complementizers. In all of the grammatical patterns, the C in the clause where the null wh takes scope agrees with the wh-expression. The only ungrammatical pattern is one in which the C where the wh takes scope fails to agree, as in (59e). That is, the silent wh must always surface in the specifier of an agreeing C.

The *an*-forms in mixed *u*-chains display identical agreement patterns except for the matrix clause where the *an*-form surfaces. In wh-questions, the agreeing C can occur in any but the highest C^0 position:

(60) a. **K-an l-a**-ñu   wax **k-u** jigéén j-i   foog **k-u** ma dóór
        CM-*an* xpl-*a*-3pl say   CM-*u* woman CM-def.prox think CM-*u* 1sg hit
        'Who did they say that the woman thinks that I hit?'

   b. **K-an** **l-a**-ñu   wax **l-a** jigéén j-i   foog **l-a**-a   dóór
        CM-*an*   xpl-*a*-3pl say   xpl-*a* woman CM-def.prox think   xpl-*a*-1sg hit
        'Who did they say that the woman thinks that I hit?'

   c. **K-an l-a**-ñu   wax **l-a** jigéén j-i   foog **k-u** ma dóór
        CM-*an* xpl-*a*-3pl say   xpl-*a* woman CM-def.prox think CM-*u* 1sg hit
        'Who did they say that the woman thinks that I hit?'

   d. **K-an l-a**-ñu   wax **k-u** jigéén j-i   foog **l-a**-a   dóór
        CM-*an* xpl-*a*-3pl say   CM-*u* woman CM-def.prox think xpl-*a*-1sg hit
        'Who did they say that the woman thinks that I hit?'

   e. ***K-an k-u** ñu wax **k-u** jigéen j-i   foog ne **k-u** ma dóór
        CM-*an* CM-*u* 3pl say   CM-*u* woman CM-def.prox think FRC CM-*u* 1sg hit
        Intended: 'Who did they say that the woman thinks that I hit?'

(60a) shows an *an*-form with no agreement in the matrix clause, but C-agreement in the intermediate and most embedded clauses. For the embedded clauses, this is the same agreement pattern found in (59a). In (60b), there is no agreement in the matrix clause or in either embedded clause. This is the embedded clause pattern in (59b). In (60c), only the most embedded clause displays agreement. With respect to the embedded clauses, this is like (59c). In (60d), the intermediate clause shows agreement while the most embedded clause does not. In this case, the pattern for the embedded clauses is like (59d). (60e), the only ungrammatical pattern, is one in which the highest C displays agreement with the *an*-form. The available patterns in wh-questions are summarized in Table 5:

24

(61)   Table 5 C-Agreement Patterns for Null and Overt Wh-Expressions

	CP1	CP2	CP3
Null wh	**+Agr**	+Agr	+Agr
		+Agr	−Agr
		−Agr	+Agr
		−Agr	−Agr
Overt wh	**−Agr**	+Agr	+Agr
		+Agr	−Agr
		−Agr	+Agr
		−Agr	−Agr

Table 5 shows that both the null and overt wh-expressions display root/embedded asymmetries. For the null wh's, the agreeing complementizer must occur in the highest C position. For the overt wh's, the agreeing complementizer cannot occur in the highest C position in questions.

Looking at the patterns of agreement in Table 5, one issue that arises is why the overt wh-expressions do not surface in the specifier of an agreeing C, an *u*-form. This looks like a Doubly Filled Comp Effect. What is puzzling is that in ordinary relative clauses, there is no Doubly Filled Comp Effect. For example, given the raising analysis of relative clauses and the analysis of the *u*-forms, the noun *xale* 'child' in (62) is in SpecCP:

(62) $[_{CP}$ [**xale** $]_k$ $[_{C'}$ **b-u** $[_{TP}$ Ayda gis t_k]]] = 'a child that Ayda saw'
          child   CM-*u*   ayda see

It appears that Wolof displays Doubly Filled Comp Filter effects in questions, but not in relative clauses. I leave it as an open question as to how to account for this difference between *u*-relative clauses and *u*-interrogative clauses in Wolof.[26]

The pattern of Wolof complementizer agreement is consistent with the generalization concerning agreement in Niger-Congo languages discussed in Baker (2008). Baker contrasts complementizer agreement in Indo-European languages like Dutch and German with that found in Bantu languages. Baker posits a "Direction of Agreement Parameter", the setting of which determines the direction in which an agreeing head, like a C^0, looks for something to agree with. For the Niger-Congo languages, the parameter is set so that an agreeing head looks "upward" and only agrees with an NP/DP that asymmetrically c-commands the agreeing head. This can be seen in Bantu languages like Swahili:

Swahili
(63) **kitabu**   amba-**cho** a-li-(ki)-soma   shule-ni[27]
          CL7.book COMP-CL.7 CL1.SUBJ-PAST-CL.7-read school-LOC
          'the book that he read in school'

In (63), the relativized *kitabu* 'book', which is in noun class 7, triggers agreement, -*cho*, on the complementizer *amba*. The *amba* itself is homophonous with the verb meaning 'say'. The agreeing complementizer looks upward to the (relativized) nominal in SpecCP to determine

---

[26] This interrogative-relative distinction makes Wolof similar to (some dialects of) English, as observed by Zwicky 2002. He shows that that the Doubly Filled Comp Filter can be violated in (embedded) questions but not in relative clauses:

  (i) I'm not sure **what kind of a ban** <u>that</u> FIFA has in mind   (Adapted from Zwicky 2002, #1)

Zwicky does not describe these as cases of Doubly Filled Comp Filter violations. He refers to them as "WH + *that* clauses". He says of his data set, "Certainly, none of them is of a transparently relative type, that is, there are no examples of ordinary restrictive relatives with WH + *that*" (p. 223). Zwicky argues that the English construction is *not* like the cases of Doubly Filled Comp violations that are found in some Germanic varieties.
[27] This is adapted from Buell (2002).

agreement. In contrast, in the Indo-European languages that manifest complementizer agreement, like West Flemish, complementizers agree with (lower) nominative subjects, but do not agree directly with operators in SpecCP:

> West Flemish
> (64) K-peinzen dan-**k**   (ik) morgen   goan[28]
>   I-think   that-1sg I   tomorrow   go
>   'I think that I'll go tomorrow'

The Wolof cases that we have seen pattern with Bantu in that agreement is spec-head. For the *u*-construction, the complementizer -*u* agrees with the asymmetrically c-commanding (null or overt) wh-expression in its specifier to determine agreement. Thus, Baker's generalization holds in such distantly related Niger-Congo languages as Wolof and Swahili. (See Section 8 below for further discussion of agreement in the Bantu language Kinande.)

The existence of *u*-chains is predicted by my analysis and provides strong evidence for successive cyclicity. This can be observed directly in Wolof because the agreement on *u*-forms overtly marks the pathway of wh-movement. This holds for both null and overt wh's. However, successive cyclic movement can occur without triggering agreement, as attested by the presence of non-agreeing clefts in (59) and (60). The analysis that I argue for, combined with the existence of successive cyclic movement, makes another prediction. If the silent and overt wh-expressions in (59) and (60) originate lower in the structure, they should display connectivity effects.
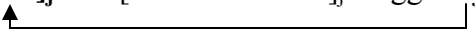
8.   Connectivity Effects in Wh-Questions
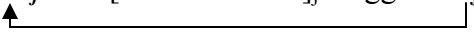
This section introduces evidence from connectivity effects that supports the conclusion that the *u*-construction is derived by movement of the null wh's. Since both null and overt wh's participate in *u*-chain formation, the presence of connectivity effects for both is expected from the analysis of *u*-chains given in Section 7. Following discussion of the Wolof-internal connectivity facts, I turn to the Niger-Congo language Kinande, which possesses a construction superficially similar to *u*-chains in Wolof.

In matrix clauses, connectivity effects under local A′-extraction can be observed:

> (65) a. L-u [xale b-u   nekk] bëgg
>   CM-*u*   child CM-*u* exist   love   Whx > ∀
>   'Who does every child love?'   ∀ > Whx
>
>   b. L-an   l-a   [xale b-u   nekk] bëgg
>   CM-*an*   xpl-*a* child CM-*u* exist   love   Whx > ∀
>   'Who does every child love?'   ∀ > Whx

As (65a-b) show, both the null wh's and *an*-forms can be interpreted in the scope of the universally quantified subject. Thus, (65a) can be used to ask for the single answer ("Which x is the x such that every child loves x?"), with wide scope of the null wh. (65a) may also call for the pair-list answer ("For every child, which x is such that the child loves x?"), with wide scope for the universal. We can account for the narrow scope interpretation of the silent wh and the *an*-form if both originate within the c-command domain of the quantified subject and can be interpreted in their base positions:
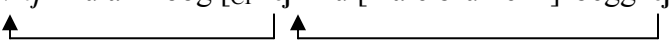
---

[28] This is adapted from Haegeman (1992).

(66) a. ***wh*_j** l-u [xale b-u nekk]_j bëgg   **t_j**   (= (65a))

   b. **[l-an]_j** l-a [xale b-u nekk]_j bëgg   **t_j**   (= (65b))

Similar connectivity patterns are found in long distance A′-extractions:

(67) a. **K-u** a   foog [$_{CP}$ **k-u** [xale b-u   nekk] bëgg
        CM-*u* 2sg think   CM-*u* child CM-*u* exist   love   Wh*x* > ∀
        'Who do you think that every child loves?'   ∀ > Wh*x*

   b. **K-an**   nga   foog [$_{CP}$ **k-u** [xale b-u   nekk] bëgg
        CM-*an* 2sg+xpl+*a* think   CM-*u* child CM-*u* exist   love   Wh*x* > ∀
        'Who do you think that every child loves?'   ∀ > Wh*x*

In (67), the wide scope reading of the universal quantifier results from the wh-expressions being interpreted as if they are c-commanded by the universal quantifier in the embedded clause:

(68) a. ***wh*_j** k-u a   foog [$_{CP}$ **t_j** k-u [xale b-u nekk] bëgg **t_j**   (= (67a))

   b. **[k-an]_j** nga foog [$_{CP}$ **t_j** k-u [xale b-u nekk] bëgg **t_j**   (= (67b))

The connectivity facts for Wolof contrast with those found in Kinande, a Zone J Bantu language with agreeing complementizers, as discussed in a series of papers by Schneider-Zioga (1995, 2007a, 2007b, 2007c, 2009):

(69) a. EkIhI_j   **kyO**   Mary' a-ka-langIra   x_j ?[29]
        what(CM.7) that(CM.7) mary   SM-PRES-see
        'What does Mary see?'

   b. ABahI_j   **bO**   Yosefu alangIra x_j ?
        who(CM.2) that(CM.2) Joseph saw
        'Who did Joseph see?'

   c. IyOndI_j   **yO**   Yosefu alangIra x_j ?
        who(CM.1) that(CM.1) Joseph saw
        'Who did Joseph see?'

As in Wolof, the agreeing complementizers (in bold) in (69) vary according to the noun class of the wh-word.   In (69a), the complementizer *kyo* agrees with the wh-word *EkIhI* "what". Similarly, the complementizers *bO* and *yO* in (69b) and (69c) agree with the wh-words that precede them *aBahI* 'who' and *iyOndI* 'who' respectively.   Schneider-Zioga notes that "agreement appears anytime there is operator like movement" (p. 73). These contexts include relativization, clefting, and focusing.

In Kinande, when a wh-word is extracted from an embedded clause, multiple occurrences of the agreeing complementizer occur obligatorily on the left edge of every clause in the pathway of operator movement:

---

[29] Adapted from Schneider-Zioga (1995) where SM = subject marker

(70) [**ekihi**   **kyo**   Kambale asi [nga **kyo**   Yosefu[30]
     what(CM.7) that(CM.7) Kamabale know comp that(CM.7)Yosefu

     akalengekanaya nga   **kyo**   Mary' akahuka ___]]]
     thinks   comp that(CM.7) Mary' cooks
     'What did Kambale know that Yosefu thinks that Mary is cooking (for dinner)?'

Recall that in Wolof, lower C's may or may not display agreement with the moved wh-expression ((59)-(60)). Schneider-Zioga argues that the multiple agreeing complementizers in cases like (70) do *not* arise from successive cyclic movement of the wh-word in Kinande. Instead, she argues that the pattern comes about from C-agreement with (multiple) null resumptive pronouns, that are generated on the left edge of the clause, roughly:

(71) [wh/focus$_j$ *wh-agr* [$_{IP}$ ..... [$_{CP}$ OP(erator)$_j$ *wh-agr* [$_{IP}$.... ___$_j$]]]

In (71), the wh-word (or focused XP) is base generated in its surface position. The wh-word is coindexed with a pronominal(-like) operator ("OP(erator)") in the lower SpecCP. It is the operator that triggers agreement on C (the "*wh-agr*").
    In arguing for the analysis in (71), Schneider-Zioga contrasts reconstruction in local and long distance A′-extractions. She shows that a reconstructed reading is possible in Kinande local A′-extraction in (72a), schematized in (72b):

(72) a. **ekitabu kiwe$_{j/k}$** ky'   **obuli mukolo$_j$** akasoma kangikangi[31]
        book   his   wh-agr each   student   reads   regularly
        '(It is) his$_j$ book that [every student$_{j/k}$] reads regularly'

     b. [….[[every student]   reads [his book]   regularly]

In (72a), the quantified subject *obuli mukolo* 'each student' can bind the pronoun *kiwe* 'his'. In contrast, in long distance A′-extractions, the reconstructed reading is unavailable:

(73) a. **ekitabu kiwe$_{k/*j}$** kyo   ngalengekanaya [$_{CP}$ nga.*kyo*[32]
        book   his   wh-agr I.think   that.wh-agr

     [**obuli mukolo**]$_j$ akasoma kangikangi
       every student   read   regularly

     '(It is) his$_{k/*j}$ book that I think [every student]$_j$ reads regularly'

     b. *[……]   [I think   [[every student] reads   [his book] regularly]

Unlike (72a), in (73a) the quantified embedded subject cannot bind the pronominal possessor *kiwe* 'his'. Schneider-Zioga interprets the lack of connectivity in long distance A′-extraction as evidence that Kinande lacks successive cyclic A′-extraction. This means that the wh-expressions that appear in multiple C-agreement cases like (70) do not originate in an argument position in

---

[30] Adapted from Schneider-Zioga (2007c), example (1). In that work, the class 7 agreeing complementizer *kyo* is glossed as, "wh-agr".
[31] Adapted from Schneider-Zioga (2007c, #6-7).
[32] Adapted from Schneider-Zioga (2007c, #8-9).

the most embedded clause.[33] In contrast, for Wolof the presence of connectivity effects coupled with the presence of complementizer agreement indicates that the null and overt wh-expressions are not base generated in A′-positions but, do indeed move successive cyclically from TP-internal positions.

Both Schneider-Zioga's analysis and the analysis I offer for Wolof have in common that an element in SpecCP triggers agreement on C. In this way, C-agreement is local in both Kinande and Wolof. The difference is how the triggering XP in SpecCP ends up there. Under Schneider-Zioga's analysis for Kinande, the wh-expression and intermediate (null) pronominals are all base generated in their surface positions. In contrast, in Wolof a single element originates in an argument (or adjunct) position and subsequently triggers agreement as it moves. The comparison of Wolof and Kinande is instructive because the patterns of morphological complementizer agreement on the surface are very similar, while the proposed mechanisms that generate them are quite different.

9. Additional Issues in the Analysis of the Relative Markers

While my analysis of the relative markers (and the positing of null wh's) accounts for several properties of the *u*-construction, other problems arise as a result. I briefly discuss some of these here. The analysis of embedded wh-questions with *u/i/a*-forms on the left edge of the embedded clause is basically the same as that for the matrix *u*-construction. Recall the paradigm:

> *u*-Form Embedded Question
(74) a. Laaj-na-a   Ayda [**k-u   ko   def**]   = *ask* Ayda $[_{CP} [wh_{ki\text{-}class}] [_{C'} \textbf{k-u}...]]$
      ask-FIN-1sg ayda   CM-*u* 3sg do
      'I asked Ayda who did it'

> *i*-Form Embedded Question[34]
   b. Laaj-na-a   Ayda [**k-i   ko   def**]   = *ask* Ayda $[_{CP} [wh_{ki\text{-}class}] [_{C'} \textbf{k-i} ...]]$
      ask-FIN-1sg ayda   CM-*i* 3sg do
      'I asked Ayda who did it'

> *a*-Form Embedded Question
   c. Laaj-na-a   Ayda [**k-a   ko   def-oon**] = *ask* Ayda $[_{CP} [wh_{ki\text{-}class}] [_{C'} \textbf{k-a} ...]]$
      ask-FIN-1sg ayda   CM-*a* 3sg do-past
      'I asked Ayda who did it (long ago)'

By my analysis, the representation of (74a-c) is:

(75)

---
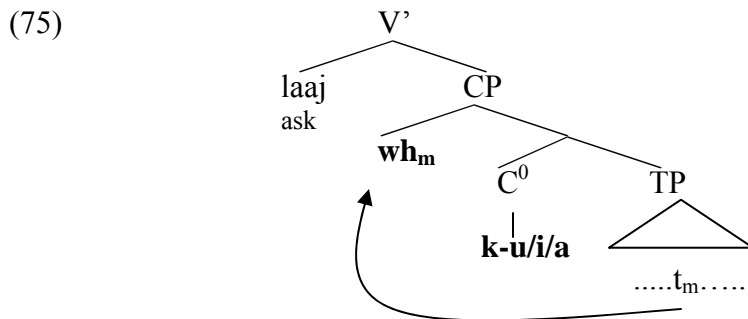
[33] Schneider-Zioga also shows that complementizer agreement can amnesty certain island violations. I do not discuss these here as I am unable to construct analogous violations for Wolof.
[34] Ivano Caponigro (p.c.) suggests that (74b-c) are in fact instances of relative clauses with a silent nominal head that are interpreted as concealed questions. This is why they do not occur as matrix wh-questions. I leave this as an open question.

Given the data in (74), one question is why *i/a*-forms do not occur in matrix wh-questions, as noted previously:

(76) **K-i/a** ko def   (= $[_{CP}$ [*Wh$_{ki\text{-}class}$*] $[_{C'}$ k-i/a ko   def]])
  CM-*i/a* 3sg do   NP$_{wh}$ CM-*i/a* 3sg do
  'the one who did it'
  *'Who did it?'

Under my analysis, the lack of matrix *i/a*-form questions is now recast as a distinction between the types of permissible complementizers in matrix versus embedded wh-questions. Wolof has a set of silent and overt wh-expressions that occur in both matrix and embedded clauses. In interrogative clauses, the *u*-form appears in matrix and embedded wh-questions, while the *i/a*-forms occur only in embedded wh-questions.

While this is descriptively adequate, the *existence* of three distinct agreeing complementizers (*u*-forms, *i*-forms, and *a*-forms) that occur with the silent wh-expressions does not follow from my analysis itself.[35] At this point, it is not obvious how to proceed to account for this distribution. This is because it could result from the properties of the complementizers, the properties of the null wh's, or some combination thereof. The ultimate question of why *i/a*-forms do not occur in matrix wh-questions does not bear directly on the basic analysis of the relative markers as complementizers presented here though. I therefore leave a finer-grained analysis of the properties of *u/i/a*-forms to future research.

Another property which may follow from my analysis is that *u*-forms cannot occur in sluices, but the *an*-forms can:

(77) Jënd-në-ñu l-enn,   wànte xam-u-ma   ***l-u/ ✓l-an**
  buy-FIN-3pl CM-'1' but   know- neg-1sg CM-*u*/CM-*an*
  'They bought something, but I don't know what'

The Wolof sluicing facts are consistent with two distinct analyses of sluicing. Merchant (2001) formulates the 'Sluicing-Comp Generalization':[36]

(78)   In sluicing, no non-operator material may appear in COMP

In Merchant's analysis, 'COMP' refers to the bracketed string in (79) below:

(79) $[_{CP}$ XP$_{[+WH]}$ C^0 $[_{IP}....]]$
       ‿‿‿‿‿‿‿
         COMP

According to the proposed analysis of the *u*-construction, the *u*-forms are complementizers, i.e. non-operators. However, they contain operators, the silent wh-expressions in their specifiers. For Merchant, 'material' in the Sluicing-Comp generalization refers to pronounced material. The Sluicing-Comp Generalization predicts (77) to be ungrammatical with the *u*-form because non-operator material, i.e. *u*-form, appears in 'COMP'. By the analysis here, the sluiced clause is:

(80) *xam-u-ma $[_{CP}$ wh$_i$ **CM-u** $[_{IP}$... t$_i$]]   (= (77))
  know-NEG-1sg   ‿‿‿‿‿‿‿
                                COMP

---

[35] This was pointed out by Marcel den Dikken (p.c.)
[36] Thanks to a reviewer for pointing out the connection to Merchant's analysis.

Note that Merchant does not say for which complementizer the Sluicing-Comp Generalization holds. In contrast, Baltin (2006) argues that sluicing involves elision of a FocusP, a phrase low in the complementizer field.[37] This is consistent with the fact that the *an*-forms, which surface in cleft clauses, can be sluiced, but not *u*-forms, which do not involve a focus phrase. Since the *u*-forms are complementizers, which are not clefted (i.e. focused), they are predicted to be ungrammatical in a sluice. Thus, the sluicing facts could result from either the Sluicing-Comp Generalization or Baltin's analysis. Van Craenenbroeck and Lipták (2005) argue that sluicing differences between languages like Hungarian and English are related to type of wh-movement in the language. In English wh-movement targets SpecCP, while in Hungarian it targets FocusP. This appears similar to the Wolof difference in that *an*-forms are clefted, while the silent wh-expressions occur in SpecCP of a relative-type construction.

Certain coordination facts also do not follow directly from the proposed analysis. Specifically, the *u*-forms cannot be coordinated, but the *an*-forms can be:

(81) a. ***k-u**   ak **l-u**   ñu dàq   *ak* = DP coordinator
         CM-*u*   and CM-*u*   3pl chase
         'Who and what did they chase?'

     b. ***k-u**   te **l-u**   ñu   dàq   *te* = TP,CP coordinator
         CM-*u*   and CM-*u*   3pl   chase
         Intended: 'Who and what did they chase?'

Interestingly, coordination with an *u*-form is not entirely impossible, as there are instances in which *u*-forms occur with a coordinator and an *an*-form:

(82) a. **k-an**   te **l-u**   ñu dàq[38]
         CM-*an*   and CM-*u*   3pl chase
         'Who and what did they chase?'

     b. ***k-an**   ak **l-u**   ñu dàq
         CM-*an*   and CM-*u*   3pl   chase
         Intended: 'Who and what did they chase?'

The only difference between (82a) and (82b) is the coordinator. In (82a), the coordinator is *te*, the TP/CP coordinator. In (82b), the coordinator is the DP coordinator *ak*. This suggests that (82a) involves *clausal* coordination, not coordination of the *u*-form itself. In that case, most of the first clausal conjunct, except the wh-operator *k-an*, has been elided. The second clausal conjunct consists of an *u*-clause in which the silent wh-word has undergone movement to the specifier of CP. It is unclear what kind of clause has undergone elision in (82a). A reviewer points out that, as shown in Nevins, Rodrigues, and Vicente (2008), an elided TP and the non-elided TP need not be identical in structure. Thus, the input structure to (82a) could be a cleft clause in the first conjunct. As with the other issues discussed in this section, I leave the analysis of coordination and its interaction with wh-expressions as an open issue that is not by itself resolved by the analysis that I have argued for.

10. Conclusions and Open Issues
I have argued for several points concerning the morphosyntax of wh-items and complementizers in Wolof by looking at the interrogative *u*-construction. One of the central claims I make is that Wolof possesses a set of null wh-expressions that surface in the specifier of an agreeing complementizer (the *u*-forms and other relative markers). At first glance, the agreeing

---

[37] Thanks to a reviewer for bringing Baltin's analysis to my attention.
[38] Thanks to Satoshi Tomioka for suggesting that I look at these cases.

complementizer appears to be the wh-expression in the construction. However, investigation of a range of cases in which *u*-forms occur led to the conclusion that the *u*-forms (and other relative markers) are in fact complementizers and not wh-expressions or nominals of any kind.

In the typology of wh-items, Wolof is unusual in possessing a large inventory of null wh's. Indeed, I concluded that null wh-expressions, like overt wh-expressions, are found in every noun class in Wolof. Other languages have been argued to possess silent wh-expressions (or null wh-operators), but these typically correspond to a very restricted set of wh-items (like "what" for most speakers that allow wh-drop in Dutch). Language-internally, both the null and overt wh-expressions share a number of properties. For example, both types of wh exhibit island sensitivity and full connectivity effects, which is predicted from a movement analysis. The connectivity effects are particularly useful analytically since they demonstrate that both types of wh originate in ordinary argument/adjunct positions and move to their surface positions. At the same time, it was shown the the null and overt wh-expressions distribute differently. While the null wh's always surface in SpecCP, the overt wh's never do in questions. In addition, the null wh's appear in non-interrogative contexts like free relative and indefinite clauses. The overt wh's do not occur in free relative or indefinite clauses. Thus, the differences between the null and overt wh's are not merely phonological, but correspond to syntactic and semantic asymmetries. In the cross-linguistic context, Wolof null wh's share properties with both silent and overt operators found in other languages. The obligatory occurrence in SpecCP is a property that null wh's in Wolof share with null object operators in German, for example. The Wolof null wh's also seem similar to overt wh-indefinites in other languages, like Japanese because they appear in other quantifier/indefinite expressions. Given this collection of properties, at this point it is unclear how the Wolof null wh's fit into the larger typology of (wh)-indefinites.

I have also argued that the complementizer agreement in Wolof corresponds to a spec-head relation between C and the element in its specifier. This is why the existence of *u*-chains, coupled with the presence of connectivity effects, provides overt evidence for successive cyclic wh-movement in Wolof. While the analysis of the relative markers as complementizers accounts for a number of distributional propeties, there are open issues that require further research. One question touched on previously is why there are three different complementizers that appear in wh-questions in Wolof. Related to this is the issue of why the *i/a*-forms only appear in embedded wh-questions. One natural line of attack would be to investigate whether there are any semantic differences between the use of the different complementizers. While there are basic issues that remain to be understood with the distribution of the agreeing complementizers, the analysis I propose provides a framework for further research into these issues.

References

Baltin, Mark. 2006. 'Doubly-Filled Comps are not Doubly Filled Comps. Baltin website: http://www.nyu.edu/gsas/dept/lingu/people/faculty/baltin/papers/Doubly-Filled-Comps.pdf.
Baker, Mark. 2008. *The Syntax of Agreement and Concord*. New York: Cambridge University Press.

Buell, Leston. 2002. "Swahli *Amba*-Less Relatives without Head Movement". *UCLA Working Papers in Linguistics, Number 8, Papers in African Linguistics 2*, Harold Torrence (ed.), pp. 86-106. Los Angeles, CA: University of California, Los Angeles Department of Linguistics.

Cardinaletti, Anna. 1994. *La sintassi dei pronomi*. Bologna: Il Mulino.

Cheng, Lisa Lai-Shen. 1991. *On the Typology of Wh-Questions*. New York: Garland Publishing, Inc.

Chomsky, Noam. 1977. "On *wh*-movement". In *Formal Syntax*, Culicover, Wasow, and Akmajian (eds.). pp. 71-132. New York: Academic Press.

Church, Eric. 1981. *Le Systeme Verbal du Wolof*. Documents Linguistiques, N° 27. *Dakar*: Université de Dakar, Département de Linguistique Générale et de Langues Négro-Africaines.

van Craenenbroeck, Jeroen and Aniko Lipták. 2005. "Ellipsis in Hungarian and the Typology of Sluicing". In *Proceedings of the Seoul 2005 International Conference on Generative Grammar*, K. Choi and Ch. Yim (eds.), pp. 103-134. Seoul: Hankook.

den Dikken, Marcel. 2006. Review of *Phases of interpretation*. *Journal of Linguistics*, 43:2, pp. 440-449.

den Dikken, Marcel. 2010. "Arguments for successive-cyclic movement through SpecCP". In *Linguistic Variation Yearbook 2009*, Jeroen van Craenenbroeck (ed.), pp. 89-126. Amsterdam, Philadelphia: John Benjamins Publishing Company.

Dunigan, Melynda B. 1994. *On the Clausal Architecture of Wolof*. Ph.D dissertation, University of North Carolina, Chapel Hill.

Goldsmith, John. 1981. 'The Structure of *wh*-Questions in Igbo'. *Linguistic Analysis*, Volume 7, Number 4, pp. 367-393.

Greenberg, Joseph. *The Languages of Africa*. 1963. Bloomingon: Indiana University Press.

Haegeman, Liliane. 1992. Theory and description in generative syntax: a case study *in West Flemish*. New York: Cambridge University Press.

Haspelmath, Martin. 1997. *Indefinite Pronouns*. Oxford: Clarendon Press.

Kayne, Richard. 1975. *The French Transformational Cycle*. Cambridge, Massachusetts: The MIT Press.

Kayne, Richard. 1994. *The Antisymmetry of Syntax*. Cambridge, Mass: The MIT Press.

Kihm, Alain. 1999. "Focus in Wolof: a study of what morphology may do to syntax". In *The Grammar of Focus*, G. Rebuschi and L. Tuller (eds.), pp. 245-273. Amsterdam: John Benjamins.

Kihm, Alain. 2005. 'Noun Class, Gender, and the Lexicon-Syntax-Morphology Interfaces: A Comparative Study of Niger-Congo and Romance Languages'. In *The Oxford Handbook of Comparative Syntax*. Guglielmo Cinque and Richard S. Kayne (eds.) pp. 459-512. New York, New York: Oxford University Press.

Koopman, Hilda. 2006. "Word Formation in Syntax and Mirror Order Violations: Wolof and Japanese". Handout from talk at University College London, October 25, 2006.

Krazter, Angelica and Junko Shimoyama. 2002. "Indeterminate Pronouns: the view from Japanese". In *The Proceedings of the Third Tokyo Conference on Psycholinguistics*, Y. Otsu (ed.). pp. 1-25. Tokyo: Hitubi Syobo.

Merchant, Jason. 2001. *The Syntax of Silence: Sluicing, Islands, and the Theory of Ellipsis*. New York: Oxford University Press.

Migeod, Frederick William Hugh. 1911. *The Languages of West Africa*. London: Kegan Paul, Trench, Trubner & CO.

Müller, Gereon. 1995. *A-bar Syntax: A Study in Movement Types*. New York: Mouton de Gruyter.

Nevins, Andrew, Cilene Rodrigues, and Luis Vicente. 2008. 'Cleaving the interactions between sluicing and preposition stranding'. In *Romance Languages and Linguistic Theory*, Proceedings of Going Romance XX, Leo Wetzels and Jeroen van der Weijer (eds.). John Benjamins.

Nishigauchi, Taisuke. 1990. *Quantification in the Theory of Grammar*. Studies in linguistics and philosophy, v. 37. Dordrecht: Kluwer Academic Publishers.

Njie, Codu Mbassy. 1982. *Description Syntaxique du Wolof de Gambie*. Dakar: Les Nouvelles Editions Africaines.

Rackowski, Andrea and Norvin Richards. 2005. "Phase Edge and Extraction: A Tagaolg Case Study". *Linguistic Inquiry*, vol. 36, no. 4, Fall, pp. 565-599.

Rialland, Annie and Stéphane Robert. 2002. 'The intonational system of Wolof'. *Linguistics*, 39-5, pp. 893-939.

Rizzi, Luigi. 1997. 'The Fine Structure of the Left Periphery'. In *Elements of Grammar*. L. Haegemen (ed.) Dordrecht: Kluwer Publications.

Robert, Stéphane. 1986. 'Le Wolof: Un Example d'Expression Morphologique de l'Emphase'. In *Bulletin de la Société de Linguistique de Paris*. Tome LXXXI. pp. 319-341.

Robert, Stephane and Anne Rialland. 2002. 'The Intonational System of Wolof'. *Linguistics*, no. 39, vol. 5. pp. 893-939.

Sapir, J. David. 1971. 'West Atlantic: An Inventory of the Languages, Their Noun Class Systems and Consonant Alternation'. *Current Trends in Linguistics*, Volume 7 *Linguistics in Sub-Saharan Africa*. Thomas Sebeok (ed.). The Hague: Paris.

Sauvageot, Serge. (1965). *Description Synchronique d'un Dialecte Wolof: Le Parler du Dyolof*. Dakar: Institut Fondamental D'Afrique Noire.

Schneider-Zioga, Patricia. 1995. "Specifier/Head Agreement in Kinande". *Cahiers Linguistiques d'Ottoawa*, 23, pp. 67-93.

Schneider-Zioga, Patricia. 2007a. "Wh-agreement reflects resumption, not movement". Handout from talk at Linguistic Society of America Annual Meeting 2007.

Schneider-Zioga, Patricia. 2007b. "Anti-agreement, anti-locality and minimality". *Natural Language and Linguistic Theory*, 25, pp. 403-446.

Schneider-Zioga, Patricia. 2007c. "Wh-agreement and bounded unbounded movement". (Msc).

Schneider-Zioga, Patricia. 2009. "Wh-agreement and bounded unbounded movement". In *Merging Features*, José Brucart, Anna Gavarró, and Jaume Solà (eds). pp. 46-59. New York: Oxford University Press.

Svenonius, Peter and Christopher Kennedy. 2006. "Northern Norwegian Degree Questions and the Syntax of Measurement. In *Phases of Interpretation*, Mara Frascarelli (ed.), pp. 129-157. Berlin: Mouton de Gruyter.

Sy, Mariame Iyane. 2003. *Wolof Noun Classification: A Constraint-based Approach*. Master's Thesis, University of California, Los Angeles.

Torrence, Harold. 2000. *Verb Movement in Wolof*. Master's thesis, University of California, Los Angeles.

Torrence, Harold. 2003. 'Verb Movement in Wolof'. In *Papers in African Linguistics 3*. *UCLA Working Papers in Linguistics*, Number 9. Jason Kandybowicz (ed). Los Angeles: University of California Los Angeles Linguistics Department.

Torrence, Harold. 2005. *On the Distribution of Complementizers in Wolof*. Ph.D Dissertation, University of California, Los Angeles.

Torrence, Harold. 2008a. "Aspects of the Left Periphery of wh-Questions in Wolof". Handout from talk given at Leiden University.

Torrence, Harold 2008b. "The Morphosyntax of Wolof Clefts: A′-Movement Properties". Under review.

Wilson, W.A.A. 1989. 'Atlantic'. In *The Niger-Congo Languages*, John Bendor-Samuel (ed.), pp. 81-104. Lanham, MD and London: University Press of America, Inc.

Zribi-Hertz, Anne and Lamine Diagne. 2002. 'Clitic placement after syntax : evidence from Wolof pronouns and person markers'. *Natural Language & Linguistic Theory*, 20-4, pp. 823-884.

Zwicky, Arnold. 2002. "I Wonder What Kind of Construction This Example Illustrates". In *The Construction of Meaning*, David Beaver, et al. (eds.), pp. 219-248. Stanford, CA: CSLI.

Department of Linguistics
University of Kansas
1541 Lilac Lane
Blake Hall-Room 427,
Lawrence, KS 66044-3177, USA

Email: torrence@ku.edu