AN LFG APPROACH TO WOLOF CLEFT CONSTRUCTIONS

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Abstract

This paper investigates the syntax of clefts in Wolof and proposes an analysis based on the Lexical Functional Grammar (LFG) formalism. Wolof clefts illustrate an interaction between morphology, syntax and information structure. In particular, they vary morphosyntactically depending on what item is clefted. Structurally, the clefts lack the cleft pronoun, are mono-clausal at the phrasal level, however, bi-clausal at the functional level. Furthermore, they relate to copular constructions in that both instantiate the same form. Thus, an understanding of these constructions is a prerequisite for understanding how clefting works.

In this paper, I review different approaches towards copula predication within LFG and present my analysis of Wolof data. I propose a parallel syntactic approach that assumes a close-complement (PREDLINK) for copular and cleft clauses. In addition, I posit an i(nformation)-structure projection to allow for extra-syntactic analysis.

1   Introduction

This paper explores the copula-cleft connection in Wolof, which has basically three types of clefts (Torrence, 2005), as given in (1)[1].

(1)   a.   (*xale yi*) ***ñu-a***   *lekk jën wi.*   subject cleft
child the 3pl-COP eat   fish the

'It's the children who ate the fish.'

b.   i.   (*xale yi*) *jën wi* ***la-ñu***   *lekk.*   non-subject cleft
child the fish the COP-3pl eat

'It's the fish that the children ate.'

ii.   *jën wi* ***la***   *xale yi lekk.*   non-subject cleft
fish the COP.3 child the eat

'It's the fish that the children ate.'

c.   (*xale yi*) ***da-ñu***   *lekk jën wi.*   verb cleft
child the COP-3pl eat   fish the

'What the children did is eat the fish.'

The cleft sentences in Examples (1a-1c) vary morphosyntactically depending on what item is clefted. Such an item is determined by means of special morphemes (e.g. *ñu-a*, *la-ñu* and *da-ñu*) which put the discourse function (DF) focus on the subject (1a), non-subject (1b-i-1b-ii) and verb constituent (1c), respectively. Morphophonologically, the discourse markers can be decomposed into a pronominal base (e.g. *ñu*) combined with a copula (e.g. *–a*, *la-*, *da-*). In subject and non-subject

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[1]The material in parenthesis is a non-obligatory subject. Wolof permits an independent clause to lack an explicit subject (see Torrence (2003) among others).

focus clauses, the clefted material immediately precedes the discourse marker. In verb clefts, however, it follows this marker. Thus, the initial subject in (1a) (i.e. *xale yi* "the children") appears in the standard subject position which is also a focus position. In contrast, in the non-subject cleft in (1b-i), the same position is occupied by the verbal object which typically bears a complement function (CF). Accordingly, this sentence has a completely different structure with the object in focus and the initial subject in topic position. Furthermore, Example (1b-i) shows that in case of a topicalization of the subject, this constituent must be resumed by a subject marker (i.e. *ñu*). In (1b-ii) however, no topicalization holds and hence no need for resumption, which otherwise would lead to ungrammaticality.[2]

The clefts in (1a-1c) are related to copular constructions in that both construction types instantiate the same form. Like clefts, each of the clauses in (2) exhibits a distinct morphology. Futhermore, sentences (2a) and (2c) may have a cleft reading, as can be seen from their translations. Such constructions basically contrast with ordinary clefts in that they contain a nominal predicate and often instantiate the imperfective (IPFV) aspect marker.

(2) Wolof copular constructions

   a. *xale yi ñu-a-y   baykat.*   Subject copula
      child the 3pl-COP-IPFV farmer
      'The children are farmers.' / 'It's the children who are farmers.'

   b. *xale yi baykat la-ñu.*   Non-subject copula
      child the farmer COP.3pl
      'The children are farmers.'

   c. *xale yi da-ñu-y   baykat.*   Predicate copula
      child the COP-3pl-IPFV farmer
      'The children are farmers.' / 'It's because the children are farmers.'

This paper is organized as follows. Section 2 will review the different approaches to copular constructions within LFG and then present a new analysis of Wolof predication. Section 3 is devoted to an examination of clefting and its relationship to the information structure. In Section 4, I will present the LFG-based analysis proposed for Wolof clefts. In Section 4.3 I deal with a few complex problems of the syntax-information-structure interface raised by Wolof clefts and give arguments for the appropriateness of an i-structure projection. Section 5 will briefly discuss the analysis of Wolof adjectival constructions. I conclude with Section 6.

2   Copula Constructions in LFG

The literature on copular analyses in the LFG framework can basically be split into two main types: a single-tier and a double-tier analysis (Nordlinger and Sadler,

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[2]Note that in structures like (1b-ii), the copular form *la* expresses only the person feature and remains the same for singular and plural subjects.

2007). The second analysis type has been investigated in more details by Dalrymple et al. (2004) who divided it into two variants that differ in a significant way: (i) an open-complement double-tier (XCOMP) and (i) a closed complement double-tier analysis PREDLINK (Butt et al., 1999). These approaches are extensively discussed by Attia (2008) and Sulger (2009). I will only briefly review them in Sections 2.1 and 2.2.

2.1 Single Tier Analysis

The single-tier analysis is one possible way of dealing with copula constructions in LFG (Nordlinger and Sadler, 2007). Nordlinger and Sadler's (2007) assumption about the single-tier analysis is drawn from the structure of verbless copula constructions. As noted by Rosén (1996), the analysis of 'verbless syntactic constructions' is appealing for the Lexical Functional Grammar (LFG) architecture which "does not stipulate that syntactic functions must be expressed configurationally at some level of the grammar" (Rosén, 1996). The single-tier analysis type stipulates that in copula constructions the predicate bears the sentential head function by selecting for a subject. This is illustrated by the clause in (3) from Russian and its associated functional representation in (4) (Nordlinger and Sadler, 2007, p. 141).

(3) Ona   vrač.
    3sg.fem.nom doctor.sg.nom
    'She is a doctor.'

$$
(4) \quad \begin{bmatrix} \text{PRED} & \text{`DOCTOR} \langle \text{SUBJ} \rangle \text{'} \\ \text{CASE} & \text{nom} \\ \text{NUM} & \text{sg} \\ \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{`pro'} \\ \text{NUM} & \text{sg} \\ \text{GEND} & \text{fem} \\ \text{PERS} & 3 \\ \text{CASE} & \text{nom} \end{bmatrix} \end{bmatrix}
$$

Beside verbless structures, Nordlinger and Sadler (2007) argued that this analysis type can also handle copular constructions for languages which have overt copulas such as English. Hence, for this approach it does not matter whether the copula is present or absent. Furthermore, Dalrymple et al. (2004) consider it adequate for cases in which the copula is optional, such as with Japanese predicative adjectives.

However, the single-tier analysis is troublesome because it has to provide evidence that the predicate can subcategorize for a subject, as the Russian noun *vrač* in (3) does. This is particularly problematic because a separate analysis must be

posited depending on whether the category of the predicate constituent (e.g. adjective vs. noun) can license a subject or not, although the predication is the same. As pointed out by Attia (2008) and Sulger (2009), the presence or absence or the copula is not enough motivation for postulating two separate analyses.

2.2 Double-Tier Analysis

The LFG formalism provides another possibility for handling predicative constructions: the double-tier analysis (Nordlinger and Sadler, 2007). This analysis type involves a copular verb which has two arguments: a subject and a predicate. The LFG literature distinguishes between two variants of this type, which differ in a significant way. In the first variant the postverbal phrase fills an open complement XCOMP function. In the second variant it bears a closed complement function PREDLINK. Both approaches are briefly reviewed in Sections 2.2.1 and 2.2.2.

2.2.1 Open-complement Double-tier

Under the open complement double-tier approach, the postverbal phrase is not considered as the sentential head. It is rather interpreted as an XCOMP whose subject is controlled by the copular verb's subject (Butt et al., 1999). In turn, either the copular verb (if present) or a null element (e.g. in verbless structures) is assumed to act as the sentential head (Dalrymple et al., 2004).

The main advantage with this approach is that it can easily capture phenomena like agreement between the post-copular complement and the subject of the copula via functional control. This makes it appropriate for copular constructions found in languages such as French and Norwegian which exhibit this agreement type. The French example in (5) and its related representation in (6), both from Dalrymple et al. (2004), illustrate how the open-complement double-tier analysis works for this language.

(5) Elle   est petite.
    she.F.SG is small.F.SG
    'She is small.' (French)

(6) XCOMP analysis of French copula

$$
\left[
\begin{array}{ll}
\text{PRED} & \text{'be}\left\langle \text{XCOMP} \right\rangle \text{SUBJ'} \\[2ex]
\text{SUBJ} & \left[
\begin{array}{ll}
\text{PRED} & \text{'she'} \\
\text{NUM} & \text{sg} \\
\text{GEND} & \text{fem}
\end{array}
\right]_1 \\[4ex]
\text{XCOMP} & \left[
\begin{array}{ll}
\text{PRED} & \text{'small}\left\langle \text{SUBJ} \right\rangle\text{'} \\
\text{SUBJ} & []_1
\end{array}
\right]
\end{array}
\right]
$$

Under the double-tier analysis, Example (5) consists of a subject *elle*, a copular verb *est* and a predicate which surfaces as an adjective *petite*. The adjective is assumed to have a subject which is identified with the matrix subject. As can be seen from the f-structure in (6), the control from the matrix subject through the adjective can be captured by control equations, e.g. (↑SUBJ)=(↑XCOMP SUBJ).

However, such an approach is problematic for several reasons. First of all, the assumption that the post-copular element is open implies a constraint for it to have a subject. The subject argument is required in order to satisfy the completeness criterion (i.e. a subject is needed in order to fill the control equation of the verb). This is naturally troublesome for phrasal constituents (e.g. NPs, PPs) which do not have an overt subject and, hence, would require two different subcategorization frames: one without a SUBJ argument and one for the predicative use (Butt et al., 1999). Secondly, the argument for the open complement analysis is weakened by the status of agreement across languages. The most important objection to this approach regarding agreement is that in "languages like Norwegian, for example, there is no subject-verb agreement, so that subject-adjective agreement must be treated differently from subject-verb agreement in any case" (Dalrymple et al., 2004, p. 196). Furthermore, Attia (2008) makes the counterargument that even for languages with subject-verb agreement like French, this agreement form is not the same as the subject-predicate agreement found in copular constructions. Third, the open complement analysis does not bring enough arguments to represent predicative constructions in a way that makes them distinct from normal subject raising verbs (Attia, 2008; Sulger, 2009). Finally, the main drawback of such an approach is that it results in a clash of PRED values if the post-copular complement has a subject (Dalrymple et al., 2004). This is for instance the case in closed complement clauses in English headed by an overt complementizer, as shown in (7) and (8) from Dalrymple et al. (2004, p. 194). The feature clash comes from the fact that two elements of the sentence in (7) are associated with the SUBJ function in the embedded f-structure in (8).

(7) The problem is that they appear.

$$
(8) \quad \begin{bmatrix} \text{PRED} & \text{'be} \langle \text{XCOMP} \rangle \text{SUBJ'} \\ \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{'problem'} \end{bmatrix} \\ \text{XCOMP} & \begin{bmatrix} \text{PRED} & \text{'appear} \langle \text{SUBJ} \rangle \text{'} \\ \text{SUBJ} & \begin{bmatrix} \text{PRED} & *\text{'they/problem'} \end{bmatrix} \end{bmatrix} \end{bmatrix}
$$

2.2.2 Closed Complement Double-Tier

The PREDLINK analysis is the second variant of the double-tier analysis. This approach assumes that the predicate is a closed complement and that no control

equation between the subject and the predicate is needed. This avoids the difficulty encountered with the XCOMP analysis regarding subcategorization. Categories which do not have an overt subject do not need to subcategorize for it, since this is not required for completeness. More precisely, the PREDLINK approach "models the fact that a particular property is predicated of the subject in a syntactically reasonable way and provides enough information for subsequent semantic analysis" (Butt et al., 1999, p.70). Examples (9) and (10) from Butt et al. (1999, p.70)[3], illustrate a typical PREDLINK analysis.

(9) The tractor is red.

$$
(10) \quad
\begin{bmatrix}
\text{PRED} & \text{`be}\left\langle \text{SUBJ, PREDLINK} \right\rangle\text{'} \\
\text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{`tractor'} \end{bmatrix} \\
\text{PREDLINK} & \begin{bmatrix} \text{PRED} & \text{`red'} \\ \text{ATYPE} & \text{predicative} \end{bmatrix}
\end{bmatrix}
$$

The f-structure for (9) using a PREDLINK analysis is given (10). It is interpreted as there being a copular verb *be* subcategorizing for a subject and a PREDLINK identified with the adjective *red*. This adjective, in turn, is interpreted as predicating a property of the subject and, contrary to the open-complement XCOMP approach, does not need to subcategorize for it.

As outlined in Butt et al. (1999), Attia (2008) and Sulger (2009), the close-complement analysis presents several advantages. First, it is a universal LFG treatment for predicative constructions. To this extent, it provides a deeper representation of these constructions abstracting away the several behaviours of the different constituents occupying the predicate position. As Attia (2008) pointed out, under this approach, predicative structures "receive a default f-structure analysis that expresses the existence of subject (SUBJ) and predicate (PREDLINK) as primitive grammatical functions and to consider the use of a copula as a parameter of variation across languages" (Attia, 2008, p. 148). This analysis type is independent of whether the copula is present or absent, obligatory or optional or whether agreement features hold between the subject and predicate. These parameters vary according to the specific language's properties. Second, as noted by Sulger (2009), the PREDLINK analysis is not affected by the constituent type of the copula complement. Hence, it can handle any constituent types with different semantic roles. Finally, the close-complement analysis can capture all the representations that can be modeled using the XCOMP analysis, even if encoding long-distance agreement using XCOMP may look more intuitive (Dalrymple et al., 2004, p. 196).

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[3]For the f-structure in (10) I only give the parts relevant for this discussion. For the complete structure see Butt et al. (1999).

2.3 Towards an Analysis of Wolof Copula in LFG

In this section, I present my analysis of Wolof copula predication in LFG. Wolof copular constructions are similar to the those found in Maltese and Hebrew in that they are 'verbless' (Nordlinger and Sadler, 2007). 'Technically speaking' they do not contain a verbal copula element. More precisely, they derive from morphologically complex markers which are not properly lexical words, and hence, do not project the level of lexical category. The copular constructions given in (2) have a structure which consists of (i) a subject, (ii) a complex word incorporating the copular morpheme and (iii) a predicate. The copula may surface in different forms according to the construction type. As shown in Example (2a), this complex word is the result of an incorporation process of the copula with the subject agreement marker. Morphologically, the whole complex is an agreement marker that consists of a person marker (e.g. *mu*), a copula (e.g. *-a*) and an imperfective aspect marker. It, additionally, expresses focus features. I argue that these markers bear the functional position *I* (originally for INFL) (Falk, 1984) and acts in the clause like a head. More precisely, they belong to the functional category *Icop*, which, in turn, shares the categorial features of the lexical category V.

The LFG annotation in (11) illustrates a possible lexical entry for *ñu-a-y* in (2a). Recall, however that Example (2a) is two-way ambiguous between a purely predicative and a cleft construction. Therefore, the same item *ñu-a-y* needs to be annotated in two different ways. The lexical annotation in (11) illustrates a possible analysis of this item as a copular element. The alternative analysis of the same item as cleft will be given in Section 3.4.

(11)   *ñu-a-y*   Icop   (↑PRED)='a⟨ (↑SUBJ)(↑PREDLINK) ⟩'
                              (↑VTYPE)=copular
                              (↑SUBJ NUM)$=_c$ pl
                              (↑SUBJ PERS)$=_c$ 3
                              (↑FOCUS)=(↑SUBJ).

Unlike French and Norwegian, post-copular complements in Wolof do not show any agreement with the subject. Hence, for Wolof, agreement is not enough reason for postulating an XCOMP analysis. With regard to these Wolof data, the copula is always present and obligatory, except for stative "adjectival" constructions discussed in Section 5. The occurrence of the copula is often accompanied with subject and focus marking, which are both optional. Thus, for Wolof the 'parameters of variation' (Attia, 2008) seem to play a minor role.

3   Clefts

3.1 Clefting and Information Structure

The concept of information structure relates to the type of information encoded in a particular utterance, denoted as discourse functions. In the LFG framework, DFs

are commonly classified into one of the three categories (King and Zaenen, 2004).

1. Topic/Theme/Given

2. Focus/Rheme/New

3. Contrastiveness

This traditional division assigns each of these three a particular function. Focus usually encodes new information; e.g. something that the speaker or writer expects their hearer or reader might not already know. In contrast, Topic is assumed to be given information, i.e. information that the speaker or writer expects the hearer or reader may be familiar with or that has been introduced in the discourse.

Cleft constructions are typical examples to illustrate how discourse functions can be encoded at a syntactic level. The organization of information structure is tightly linked to the clefts' function as focusing tools used by the speaker/writer when it comes to draw attention to salient parts of their message (Hasselgård, 2002). The term focus will refer in this article only to contrastive focus, so that, the clefted constituent always conveys new information in the context, which is explicitly contrasted with something in the preceding context, as Example (12) from Kihm (1999, p. 245) (emphasis, parentheses and labeling mine) illustrates. In (12) the subordinate clause contains given or known information (i.e. that someone has written *Ulysses*), while the clefted constituent introduces new information (i.e. the author of *Ulysses*, which is contrasted with other possible authors).

(12)   It is [Joyce]*Focus* [who]*Topic* wrote Ulysses.

King and Zaenen (2004) highlighted three different ways of encoding discourse functions: encoding via (i) a privileged structural position, (ii) discourse markers or particles, and (iii) a specific intentional pattern. In the first possibility, termed 'structural encoding', the particular discourse function is expected to surface in a particular phrase structure position. It has been argued, for instance, that topic and background traditionally bear an initial and postverbal position respectively, while focus often appears in both positions (i.e. pre- or post-verbal). Another possibility to encode DFs consists of using discourse markers. This possibility is used by a wide range of languages, e.g. Wolof, Japanese and Hindi. Japanese, for instance, has a topic marker *wa* while Hindi makes use of different markers to encode (exclusive or inclusive) contrastive focus (King and Zaenen, 2004). Finally, some languages such as English use intonation to signal the focused element in a sentence. Examples (13) and (14) from King and Zaenen (2004) illustrate focused constructions using discourse markers and focus stress, respectively.

(13)   [rAdha=ne=hI]*Focus* baccho=kO   kahAnI sunAyI
        Radha=erg=Foc   children=ACC story   hear
        'It was (only) Radha who told the children a story' (Hindi)

(14)   a. Did you see Mary or John?
        b. I saw [JOHN]*Focus*.

3.2 Cleft structure

As discussed in the previous section, clefting is essential to spread information of a single proposition over two clauses, hence two information units (Hasselgård, 2002). Accordingly, in many languages, including English, typical cleft sentences are overtly bi-clausal: i.e. they consist of a main clause and a subordinate clause. In turn, the subordinate clause may contain a copula and the focused element, as given in (15) (Ebert, 2011).

(15)   it COPULA X [RELATIVE $[_s$ ....]]   (Cleft)

There are, however, many other languages, including Wolof and some Bantu languages, which do not follow this typical structure. Kikuyu (Bantu), for instance, uses the discourse marker *ne* to put an element into focus via clefting (Ebert, 2011). As can be seen in (16), the cleft construction does not contain a relative clause. Hence, this sentence does not exhibit a bi-clausal structure, but rather seems to be mono-clausal.

(16)   ne   mae   Abdul a-ra-nyu-ir-ɛ
       FOC water Abdul 3SG-PRT-drink-ASP-FV
       'It is water that Abdul drank.'

3.3 Analysis of DFs in LFG

LFG offers different possibilities for analyzing discourse functions (King and Zaenen, 2004). DFs can be captured structurally or functionally (e.g. at f- or i-structure level). LFG also proposes optimality theoretic approaches for this issue.

An LFG analysis of DFs via structural encoding involves basically two possibilities. One assumption is that predicates subcategorize for DFs. Following Alsagoff (1992), King and Zaenen (2004) argued that verbs in Malay subcategorize for topic. Accordingly, in this language, topic arguments can be identified with a particular grammatical function and annotated on the corresponding affixes. Alternatively, DFs can be assigned via functional annotations on c-structure nodes. According to Bresnan and Mchombo (1987) topics in Chicheŵa are associated with a privileged c-structure position and are therefore identified with some grammatical function via anaphoric binding.

An LFG approach to discourse markers encoding DFs involves case / morphology; i.e. the link between the DF and the discourse marker is captured at the morphological level. For instance, the Hindi focus marker *hI* specifies its relation to the DF focus it is associated with via the inside out equation (FOCUS ↑) in its lexical entry, as shown in Figure 1.

```
                    X(P)
                   ╱
           X(P)  Cl-disc
           (FOCUS ↑)
               hI
```
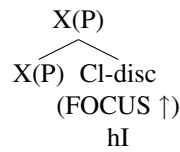
Figure 1: LFG analysis of the Hindi DF marker *hI* (King and Zaenen, 2004).

Even if the different ways of encoding DFs in LFG are well described, their adequate representation level remains controversial. DFs can potentially be represented at the f-structure or the i-structure. These two possibilities reflect the distinction between syntacticized and real discourse functions[4](Bresnan, 2001). A new analysis for Wolof will be discussed in Section 4.

3.4 Wolof Cleft

The interest of exploring the morphosyntactic properties of Wolof clefts is twofold. First of all, compared to their English counterparts, Wolof clefts look as if they have a completely different structure consisting of one clause. They also crucially differ from clefts in languages like English in that they lack the cleft pronoun, e.g. 'it'.

Secondly, in Wolof cleft clauses, the information structure is not merely a secondary component superimposed on a core syntactic one, but it rather organizes the verbal system and even conditions the choice of the inflectional markers for each cleft type. So, as Robert (2000) pointed out, Wolof represents an extreme case of grammaticalization of focus. According to Kihm (1999, p. 246) clefting is "the only means in the language to put an element into focus" and consequently, Wolof lacks the other focus expression forms found in many languages such as "focus stress as in English or focusing through position as in Hungarian". The Wolof data presented in this work, however, will show that, in fact, Wolof makes a combination of structural and morphological encoding to mark the discourse function focus. Let us first discuss some of the properties mentioned for Wolof clefts.

The morphosyntactic structure of Wolof clefts appears to be similar to those found in Hindi (see Section 3.1) in that the focus argument is encoded morphologically. Furthermore, the language exhibits a case of multiple encoding in the sense that it uses more than one strategy at the same time to put a specific element into focus. Unlike Kihm (1999), I argue that structural encoding is still available in Wolof, but seems to be deficient just because it is combined with discourse marking (i.e. morphology). In this regard, Wolof behaves like Tagalog which uses the same multiple encoding mechanism which combines position and marker (King and Zaenen, 2004). Hence, in the subject and non-subject clefts constructions given in (1), *ñu-a* and *la-ñu* are discourse function markers and the head of *I*; the constituent in SpecIP is always a focus and maps to subject function if the marker is *ñu-a* and a non-subject function if it is *la-ñu*.

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[4]For more details see Dalrymple (2001); King and Zaenen (2004) among other authors.

Abstracting away from the individual constructions given in (1), I assume for subject, verb and non-subject clefts in Wolof a unique structure consisting of: (i) an optional constituent (*XP*) which can be of different categories, (ii) a multicategorial item *SMCOP* incorporating the copula and the optional subject marker and (iii) a sentential clause *S*. This multicategorial item has two morphological structures: the subject marker can precede the copula as in subject cleft (i.e. *(SM-)COP*) or follow it as in verb and non-subject clefts (i.e. *COP(-SM)*). The Wolof cleft structure I propose is given in (17). It has a linear ordering common for the three cleft types.

(17)   Wolof cleft structure:

   a.   XP (SM-)COP / COP(-SM) $[_S [_{VP} ....V....]]$ (Cleft)

The structure in (17) is similar to the one for Kikuyu given in Section 3.2. Due to an opacifying effect of morphology, the cleft structure appears mono-clausal. At the surface level, there is no subordinate clause which is overtly introduced as some kind of relative clause. I follow Kihm (1999) in claiming that, clefts in Wolof are, in fact, bi-clausal just like their English counterparts (Kihm, 1999, 246). However, unlike Kihm (1999), I argue that this bi-clausal structure only holds at the functional level, and is not overtly expressed at the c-structure level. Hence, I rather assume that they are mono-clausal at the phrasal level.

4   Analyzing Wolof clefts in the LFG Framework

In this section I present my ideas on how Wolof clefts can be analyzed using the LFG mechanism. The next two following sections present the analysis of clefts at the c-structure and the representation of the involved DFs at the f-structure. These DFs are interpreted as the syntacticized discourse functions FOCUS and given topic (GVN-TOP), which is a special type of the topic argument. I will then examine the problems relative to the representation of these DFs in the f-structure and outline possible solutions in Section 4.2.

4.1   Constituent structure

As mentioned in Section 3.4, Wolof combines two encoding possibilities: structural and morphological encoding. DFs are assigned using functional annotations on special c-structure nodes and, at the same time, using morphology, i.e. focus markers. As Figures 2-3 show, the DF foci in Wolof are associated with *Spec IP-cop* and identified with the grammatical functions subject and complement, respectively. The assignment of focus is regulated by the morphology: the focus type varies depending on the morpheme used (e.g. *moo* vs. *la*). In addition, these figures are evidence for assuming that topics and foci are distinct in Wolof (Russell, 2006).
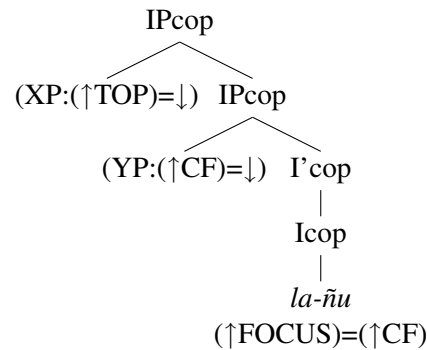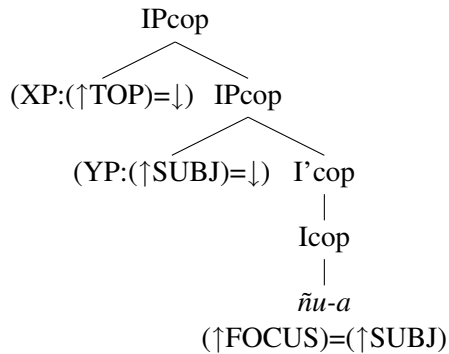
```
              IPcop                              IPcop
             /    \                             /    \
(XP:(↑TOP)=↓)  IPcop              (XP:(↑TOP)=↓)  IPcop
                /    \                             /    \
  (YP:(↑SUBJ)=↓)  I'cop             (YP:(↑CF)=↓)  I'cop
                    |                                 |
                  Icop                              Icop
                    |                                 |
                  ñu-a                              la-ñu
          (↑FOCUS)=(↑SUBJ)                   (↑FOCUS)=(↑CF)
```

Figure 2: C-structure for subj. cleft   Figure 3: C-structure for non-subj. cleft

4.2 Functional Representation

In the standard assumption of LFG, discourse function information has traditionally been encoded in the f-structure via annotations on the c-structure. Structurally encoded topic and focus arguments are considered syntacticized[5] (Bresnan and Mchombo, 1987) and placed in the f-structure alongside grammatical functions. This approach works well for languages which encode DFs using subcategorization or exhibit phenomena such as pronoun incorporation (King and Zaenen, 2004).

Concerning the Wolof data, let us first assume that the DFs found in clefts have a syntactic role similar to those discussed in Bresnan and Mchombo (1987). According to Bresnan and Mchombo (1987), in a cleft construction, the clefted constituent typically bears both functions FOCUS and TOPIC, as can be seen in (12). It is FOCUS in the main clause and TOPIC in the embedded one. However, the same constituent cannot bear both functions at the same level. Thus, one can argue that the DFs found in subject and non-subject clefts have a clear syntactic role, hence grammaticalized, and do not exhibit a mismatch regarding the associated grammatical functions. These DFs would, therefore, be represented in the f-structure.

(18)   *ñu-a*   Icop   (↑PRED)='be⟨ (↑SUBJ)(↑PREDLINK) ⟩'
                       (↑PREDLINK)=(↑FOCUS)
                       (↑FOCUS-TYPE)=contrastive
                       (↑SUBJ SUBJ NUM)=$_c$ pl
                       (↑SUBJ SUBJ PERS)=$_c$ 3.

The LFG annotation in (18) illustrates a possible lexical entry for *ñu-a* found in subject clefts as in (1a). At the functional level, the copular inflectional element *Icop* in (18) is analyzed with two arguments SUBJ and PREDLINK. As the c-structures in Figures 2 and 3 show, the content of the S-clause in (1a) *lekk jën*

---

[5]However, as Bresnan (2001, p. 97) noted, grammaticalised discourse functions like TOPIC and FOCUS should be distinguished from real discourse functions which are a part of discourse in a sense of communicative functions like information packaging.

wi "eat the fish" is presupposed to be already known: it is a 'given topic' (GVN-TOP, in addition to being a SUBJ). In other words, the fact that someone ate the fish is assumed to be known and is, therefore, an old information; the new information is that the one doing it was *xale yi* "the children". This can be captured by saying that 'the children' in (1a) is predicated of the property of having eaten the fish. This reversal of the roles of logical subject and predicate is what is achieved by clefts. Hence, the lexical DP (e.g. *xale yi*) which fills the specifier position of the clause (see the c-structures in Figures 2 and 3) bears both the grammatical function associated with PREDLINK and the syntacticized FOCUS function, as indicated by the equation (↑PREDLINK)=(↑FOCUS). Likewise, the subject of the cleft clause also has a subject which is here identified with FOCUS. This functional relation is captured by the equation (↑FOCUS)=(↑SUBJ SUBJ) while (↑FOCUS-TYPE)=contrastive specifies the type of the linked discourse function. The constraining equations (e.g. (↑SUBJ SUBJ NUM) =c sg) describe the subject-verb agreement required for the subject of the embedded clause.
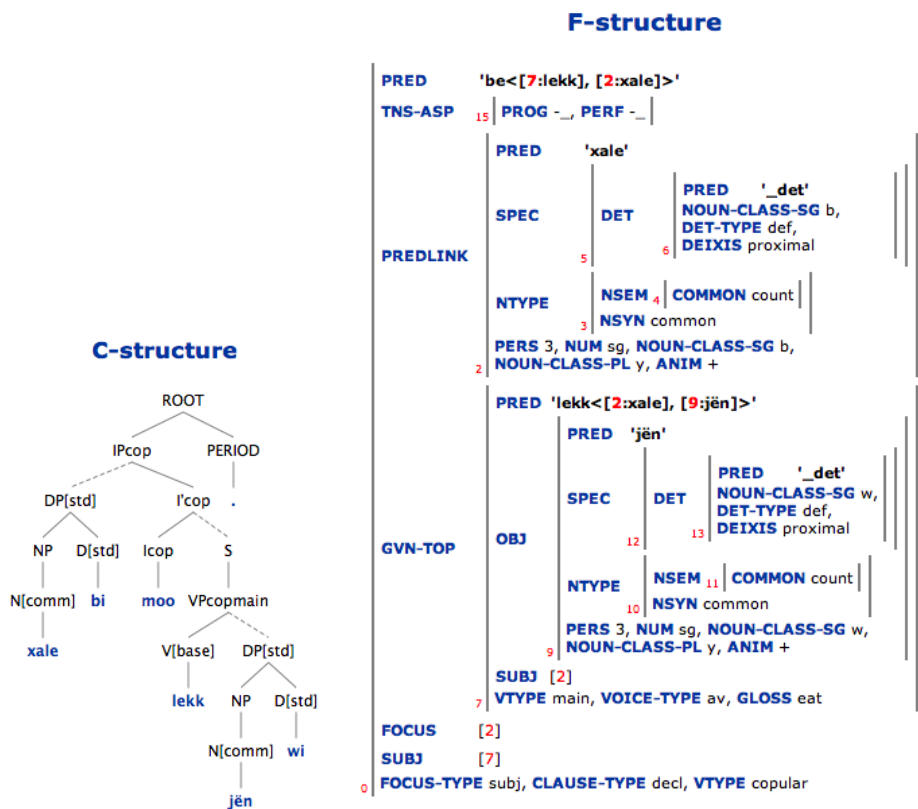

Figure 4: C- and F-structure for subject cleft

In non-subject cleft clauses, I assume that the given topic is the same, i.e. the old information. Unlike the subject cleft, however, here the non-subject constituent

bears both the grammatical function PREDLINK and the focus function since it contains the new information. This is easily captured by the parallel approach.

Figures 4 and 5 illustrate the proposed c- and f-structure for Wolof subject and non-subject clefts respectively. As the parsed samples show, the representation of DFs via lexical annotations and annotation at the c-structure tree works well for subject and non-subject clefts, assigning them both a grammatical function and a discourse function.
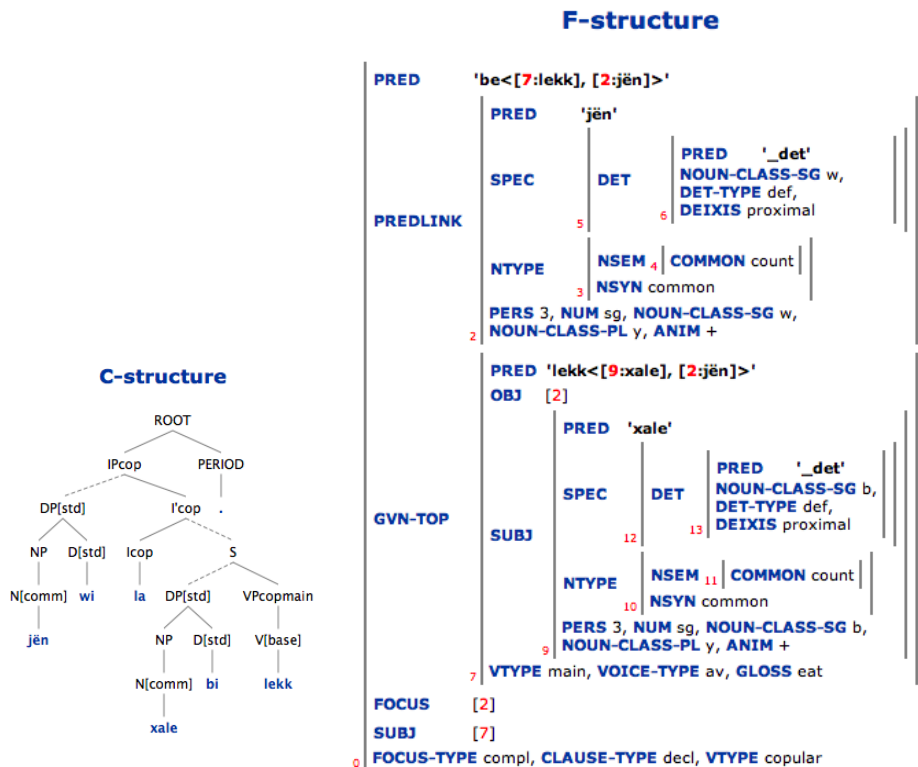

Figure 5: C- and F-structure for non-subject cleft

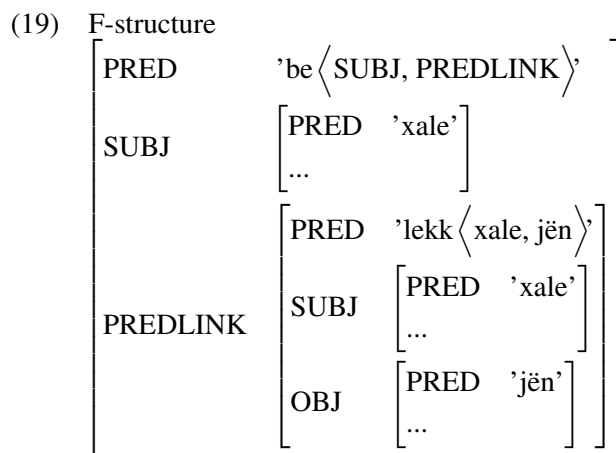## 4.3 Focusing F-structure Heads

However, as King and Zaenen (2004) reported, the representation at f-structure turns out to be ultimately problematic due to the mismatches between DFs and grammatical functions. For instance, in cases of focusing f-structure heads, "the standard annotations result in the incorrect scoping of the discourse functions in that more material is focused or topicalized than intended" (King, 1997, p. 2). This is exactly the problem encountered for the analysis of Wolof verb cleft in that focusing the f-structure head results in wider scope than desired. By assigning to the verb the discourse function contrastive focus, all the arguments included in the sub-f-structure containing the head are also contained within the discourse func-

tion. Hence, not only the verb PRED is focused, but so are its arguments (SUBJ and OBJ). This is linguistically incorrect since contrastive focus on the verb excludes focus on any material but the verb itself (King, 1997). Hence, the analysis of the verb cleft cannot be correctly predicted by this approach, and therefore needs an alternative approach.

In Example (1c), contrastive focus picks out the verb as prominent information. However, trying to capture this by lexically annotating the DF marker *da-ñu* with (↑PREDLINK)=(↑FOCUS) would result in a too wide scope. As already discussed, some DF material will not always overlap with f-structure elements (e.g. phrases which are part of the f-structure, but not of the i-structure), yielding mismatches between both structures. In order to overcome such divergences, many of the recent works on DFs within LFG proposed an independent component called i-structure for representing the information structure of a sentence instead of analyzing it within the f-structure (Butt and King, 1996; King, 1997).

To tackle this issue in Wolof, I follow King (1997) in proposing that the DF information found in the clefts be captured in this independent projection, i.e. i-structure, and that i-structure be related to c-structure through a delta projection *d* for a discourse structure. This projection is assumed to be accessible to the s(emantic)-structure, and relates to the argument structure as well. Hence, the information relevant to the i-structure is assumed to be the core predicate value without its associated argument structure.

More precisely, I combine two solutions proposed in Kaplan and Maxwell (1996) and King (1997). First, I posit an i-structure projection distinct from the f-structure, which can easily capture these mismatches. Secondly, I remove arguments of the verb retaining only the core PRED in the i-structure. This approach yields the desired partial f- and i-structures given in (19) and (20).

(19)   F-structure

$$
\begin{bmatrix}
\text{PRED} & \text{'be} \left\langle \text{SUBJ, PREDLINK} \right\rangle \text{'} \\
\text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{'xale'} \\ \ldots \end{bmatrix} \\
\text{PREDLINK} & \begin{bmatrix} \text{PRED} & \text{'lekk} \left\langle \text{xale, jën} \right\rangle \text{'} \\ \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{'xale'} \\ \ldots \end{bmatrix} \\ \text{OBJ} & \begin{bmatrix} \text{PRED} & \text{'jën'} \\ \ldots \end{bmatrix} \end{bmatrix}
\end{bmatrix}
$$

As (20) shows, only the core meaning of the PRED is focused using the PRED FN value (Kaplan and Maxwell, 1996), which remains when the arguments of PRED are removed, avoiding projecting the argument structure into the i-structure.

(20) I-structure

$$
\begin{bmatrix}
\text{FOCUS} & \begin{bmatrix} \text{D-PRED} & \text{lekk} \\ \text{FOCUS-ON} & \text{verb} \\ \text{FOCUS-TYPE} & \text{contrast} \end{bmatrix} \\[2em]
\text{GVN-TOP} & \begin{bmatrix} \text{D-PRED} & \text{'xale'} \\ \text{TOPIC-TYPE} & \text{given} \end{bmatrix}
\end{bmatrix}
$$

For Wolof, the lexical item associated with verb cleft is annotated as in (21).

(21) *da-ñu* Icop ($\uparrow$PRED)='be$\langle$ ($\uparrow$SUBJ)($\uparrow$PREDLINK) $\rangle$'
        d::* = (d::M* FOCUS)
        ($\uparrow$PREDLINK PRED FN)=(d::* D-PRED)
        (d::* FOCUS-TYPE)=contrastive
        (d::* FOCUS-ON)=verb

        ...

This analysis places the relevant core PRED of the PREDLINK in the FOCUS of the i-structure. The projection ***d::*** indicates the DF projection. Additionally, I use the * and *M** notations as proposed by Kaplan (1987). The annotation * and *M** refer to the node (i.e. $\downarrow$) and its mother ($\uparrow$), respectively. I further use additional annotations to specify the focus type and the focused constituent.

5 Discussion: Adjectives as a Missed Category

Another issue that is crucially raised by this proposal concerns the lack of adjectives in Wolof, where the adjective's role is taken over by stative verbs (McLaughlin, 2004). Adopting the single-tier analysis, I argue that, Wolof stative (adjectival) verbs behave like Japanese adjectives (Dalrymple et al., 2004) in that: (i) they provide the main PRED for the clause, i.e licensing their own subject and (ii) they do not require the copula, as seen in (22b). Also like Japanese, Wolof adjectival constructions can take an overt copula, as in (22a). However, in Wolof, this may result in a focused construction, as the English translation of Example (22a) shows.

(22) a. sa   bët bi da-fa   xonq.
          Poss2sg eye the COP.3sg red

          'Your eye is red.' / 'Your eye is RED.'

      b. sa   bët bi xonq na.
          Poss2sg eye the red   3sg

          'Your eye is red.'

Following Dalrymple et al. (2004), I assume that the stative (adjectival) verb is an open function and subcategorizes for a SUBJ. Examples (23-24) propose a

possible analysis which illustrates the contrast between the neutral reading in (23) and the focus one in (24).

(23)
$$
\begin{bmatrix}
\text{PRED} & \text{`xonq}\langle\text{SUBJ}\rangle\text{'} \\
\text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{`bët'} \end{bmatrix}
\end{bmatrix}
$$

(24)
$$
\begin{bmatrix}
\text{PRED} & \text{`xonq}\langle\text{SUBJ}\rangle\text{'} \\
\text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{`bët'} \end{bmatrix} \\
\text{FOCUS} & \begin{bmatrix} \text{xonq} \end{bmatrix}
\end{bmatrix}
$$

6 Conclusion

In this paper I have proposed a parallel syntactic approach for Wolof cleft and copular constructions using the LFG architecture. In this proposal, both the simple copula and clefts in Wolof share an uniform phrase structure and make use of the close-complement double-tier (PREDLINK) at the functional level. The PREDLINK analysis is appropriate for these constructions in that it provides a universal LFG treatment for predicative constructions and is not affected by divergent analyses of copula constructions within this language. This paper has also investigated different possibilities for capturing the discourse functions related to the Wolof clefts at the adequate representation level. On the one hand, contrastive focus in subject and non-subject clefts is considered as syntacticized as is the case in a wide range of languages which show agreement between discourse function and f-structure grammatical functions. For such languages, it has been argued that there is a syntactic topic and focus which therefore should be placed in the f-structure alongside grammatical functions. On the other hand, however, this approach cannot account for an appropriate representation of the discourse function found in Wolof verb clefts in that it includes more material in the i-structure than intended. For this purpose, this paper has postulated an independent projection i-structure to correctly account for focusing f-structure heads. Such a projection has been modeled as a projection of the c-structure, which can be accessed by the semantic structure. Furthermore, the information relevant to the i-structure has been extracted as the core predicate value without the argument structure. The proposed analysis has been implemented in a computational LFG grammar using the XLE software (Crouch et al., 2012). In the current development of the grammar, however, the encoding of DFs within the i-structure is still experimental while the internal organization of this additional projection requires further research.

7 Acknowledgements

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