A UNIFIED ANALYSIS OF COPULA CONSTRUCTIONS IN LFG

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Abstract
In this paper we maintain that a unified analysis of the copula constructions in LFG is necessary to capture syntactic generalizations. We discuss the various options available in the LFG literature and investigate their feasibility in order to arrive at the most appropriate representation. In doing so, we make use of the concepts and mechanisms already available in the framework of LFG without violating any fixed conditions or breaking with any established conventions. The conclusion we reach is that the different strategies employed in the predicational structures are language-specific variations that basically express the same grammatical function. We assume that the copula complement is a closed function, i.e. PREDLINK, which can account for almost all the different constituents that can occupy the predicate position.

1 Introduction

In this introduction we give a quick review of the three strategies used in LFG to represent copula constructions. Section 2 launches the discussion by explaining why a unified analysis is motivated. Section 3 examines the typological differences in the use of copula constructions in five languages, and surveys the interesting variety in the choice of strategies used in expressing the predicational relationship. Section 4 points out the implications of adjectives in the copula constructions. Then we proceed into a detailed account of each strategy and provide our reasons for choosing only one analysis.

Although there is no controversy regarding the c-structure analysis of copula constructions in LFG, different strategies have been proposed for the f-structure representation of these constructions, as shown by Figure 1. The treatment of copula constructions in LFG has been outlined by Nordlinger and Sadler (2006), Dalrymple et al. (2004), Butt et al. (1999) and Rosén (1996).

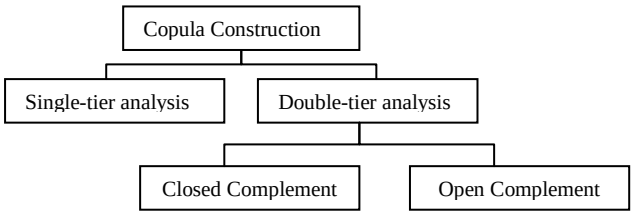

Figure 1. Possible Analyses of Copula Constructions in LFG

One possibility for analysing copula constructions, as outlined by Nordlinger and Sadler (2006), is to use the “single-tier analysis” where the predicate functions as the sentential head and selects for a subject. The example they mentioned is from Russian. It is reproduced in (1) and the corresponding f-structure is in Figure 2.

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

$$\begin{bmatrix} \text{PRED} & \text{'doctor<(↑ SUBJ)> '} \\ \text{CASE} & \text{nom} \\ \text{NUM} & \text{sg} \\ \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{'pro'} \\ \text{NUM} & \text{sg} \\ \text{GEND} & \text{fem} \\ \text{PERS} & 3 \\ \text{CASE} & \text{nom} \end{bmatrix} \end{bmatrix}$$

Figure 2. F-structure of a Russian copula sentence

The double-tier analysis is another possibility for representing the copula construction. In this approach both the subject and the predicate function as arguments within the structure. Dalrymple et al. (2004) presented a more detailed discussion of this type by dividing it into two significantly different variants. The first is to consider the predicate as a closed complement PREDLINK (Butt et al. 1999), and the second is to consider it as an open complement XCOMP.

In the closed complement analysis, the main predicate of the sentence is provided by the copula. Figure 3 shows the double tier, closed function analysis of the English sentence in (2).

(2) She is a doctor.

$$\begin{bmatrix} \text{PRED} & \text{'be<(↑SUBJ) (↑PREDLINK)>'} \\ \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{'pro'} \\ \text{NUM} & \text{sg} \\ \text{GEND} & \text{fem} \\ \text{PERS} & 3 \end{bmatrix} \\ \text{PREDLINK} & \begin{bmatrix} \text{PRED} & \text{'doctor'} \\ \text{NUM} & \text{sg} \end{bmatrix} \end{bmatrix}$$

Figure 3. A double-tier, closed-complement f-structure representation

For languages with no overt copula the main predicate is provided by special annotations on phrase structure rules. For the Russian example in (3a), the phrase structure rules in (3b) produce the f-structure in Figure 4, all adapted from Dalrymple et al. (2004).

(3) a. On student.
he student
'He is a student.' (Russian)

b. Phrase structure rule

$$\begin{array}{ccccc} S & \rightarrow & NP & \varepsilon & NP \vee AP \vee PP \\ & & (\uparrow \text{SUBJ})=\downarrow & (\uparrow \text{PRED})=\text{'null-be<SUBJ,PREDLINK>'} & (\uparrow \text{PREDLINK})=\downarrow \\ & & & (\uparrow \text{TENSE})=\text{present} & \end{array}$$

$$\begin{bmatrix} \text{PRED} & \text{'null-be<(↑SUBJ) (↑PREDLINK)> '} \\ \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{'pro'} \\ \text{NUM} & \text{sg} \\ \text{GEND} & \text{masc} \\ \text{PERS} & 3 \end{bmatrix} \\ \text{PREDLINK} & \begin{bmatrix} \text{PRED} & \text{'student'} \\ \text{NUM} & \text{sg} \end{bmatrix} \end{bmatrix}$$

Figure 4. F-structure of a verbless copula construction

The second variant of the double-tier analysis of the copula construction is the open complement analysis where the structure is subject to functional control. In this analysis the predicate selects for a subject which is controlled by the main subject of the sentence. The French example in (4) has the f-structure in Figure 5, both from Dalrymple et al. (2004).

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

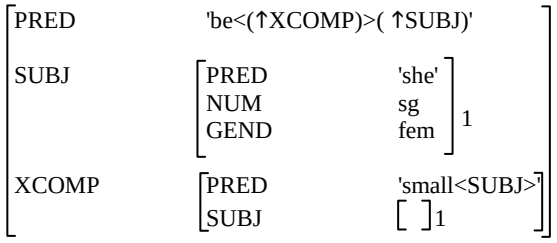

Figure 5. Open function analysis of copula constructions

However, the findings reached by Dalrymple et al. (2004) were not conclusive. They said that the XCOMP analysis is appropriate for some copular constructions but not for others, even within the same language. They pointed out that more syntactic tests need to be identified in order to determine the status of a copula complement both within and across languages. However, this research left the general perception that the open function is the preferred analysis. XCOMP has effectively replaced PREDLINK in the XLE English grammar and the DCU LFG-based probabilistic parser.

Nordlinger and Sadler (2006), on the other hand, state that the default structure is the single-tier analysis for copula-less languages because it is more economical as it assumes less structure, while languages which use overt copulas can choose a version of the double-tier analysis. Their focus was on emphasising the flexibility of the LFG framework rather than searching for a unified analysis.

2 Motivation for a Unified Analysis

A critical point in the syntactic analysis of copula constructions in the LFG literature is that it provides more questions than answers. The conclusion Dalrymple et al. (2004) reached is that a unified analysis of copula constructions is not possible either cross-linguistically or inside the same language.

> The fact that different constituents can behave differently in copular constructions means that the full range of copular constructions must be examined within a language in order to analyze it completely. That is, the fact that one type of constituent requires a certain analysis of copular constructions does not guarantee that other, superficially similar constructions will be amenable to the same analysis. (Dalrymple et al. 2004, p. 191)

Nevertheless, when talking about Russian, where the copula is null in the present tense but overt in the past and future tenses, they argued for the desirability of a unified analysis.

> For such languages, there does not appear to be any evidence that the copula-less constructions have different syntax (or semantics) from the ones with copulas. As such, a unified analysis is desirable. However, a unified analysis is possible for all languages in which the occurrence of the copula is (partially) governed by tense. (Dalrymple et al. 2004, p. 192)

Similarly Nordlinger and Sadler (2006) expressed their conviction that there is no *a priori* reason for copula constructions cross-linguistically to have the same syntactic structure and that it should be left as an empirical issue. However, they could not help raising the question again after surveying the typological differences in copula constructions:

> The fact that the choice of strategy in a given language can be influenced by superficial matters of grammatical encoding raises the interesting question as to whether the alternative strategies are externally distinct but correspond to the same f-structure. (Nordlinger and Sadler 2006)

The indeterminacy in the LFG literature regarding copula constructions constitutes practical and theoretical challenges. The practical challenge is that for the task of grammar writing it is

hard to make a choice to adopt a representation without clear-cut, well-defined criteria. Instead, a grammar writer is advised to examine the full range of copula constructions and observe the behaviour of different constituents in the predicate position to check whether the copula is overt or non-overt, obligatory or optional, and whether the agreement between subject and predicate is manifested morphologically or not. Nevertheless, these criteria are considered as clues rather than measurable and definite tests.

The theoretical challenge is that with three acceptable f-structure representations, generalizations about the predicational syntactic structures are not captured either cross-linguistically or inside the same language. Although we acknowledge that this divergence is motivated at the c-structure level, we think that this divergence is not justified at the f-structure level which is supposed to provide a deeper representation. The presence vs. absence of a copula and the presence vs. absence of morphological features denoting agreement can be considered as parameters of variation across languages that do not warrant functional variation. We propose that it is preferred to provide a unified analysis of the predication relations cross-linguistically, so that functional parallelism among functionally equivalent constructions can be maintained. Dyvik (1999) emphasised the idea that f-structures abstract away from constituent order typical of c-structures, and even assumed that f-structures are universal "in the sense that translationally corresponding expressions across languages are assigned the same (or closely similar) f-structures".

The concept of parallel levels of representation is one of the basic tenets in LFG where the c-structure variations do not affect the status of grammatical functions, and semantic roles are distinct from grammatical functions. For example, the subject can be expressed in various ways in c-structure, it can be an NP clause, a CP clause, an affix on the verb or a zero-pronoun with no node in the c-structure, yet the grammatical function of SUBJ is assigned to all these variations as the f-structure represents a deeper level of representation. Furthermore the SUBJ can be assigned different semantic roles, as pointed out by the examples in (5) from Lødrup (2006).

(5) a. He ran home (agent SUBJ)
    b. He fell down (theme SUBJ)
    c. He fantasized (experiencer SUBJ)
    d. There is a problem (non-thematic SUBJ)

The distinction between c-structure and f-structure has been maintained, to a great extent, in most syntactic structures, but with the obvious exception of the predicational constructions. Predicational structures are fundamentally similar, crosslinguistically, and yet they receive divergent f-structure analyses in LFG.

The subject-predicate relationship is a universal grammatical relationship that is found cross-linguistically. Typological studies of copula constructions never reported the absence of this clause type in any given language. Pustet (2003) reported that "serious arguments against the universality of the predicate function have never been proposed." Therefore we propose that the predicational 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 encoding of the relationship as a matter of typological differences or "paradigmatic alternations" (Nordlinger and Sadler 2006). It is a parameter of variation across languages to decide how to delimit the subject and predicate, perhaps only by juxtaposing the two elements or by inserting a pronominal or by using a copula verb. In his typological study of copula constructions Curnow (2000) points out that the choice of strategy for encoding the copula construction is conditioned by various factors.

> The choice of construction in these cases depends upon discourse and grammatical factors such as tense and aspect, polarity, the status of the clause as main or subordinate, the person of the

> Copula subject, and the semantic relation expressed (identification or classification). (Curnow 2000, p. 2)

Another point in favour of our argument is that some other syntactic theories have tended to recognize the copula constructions and treat them in a somewhat uniform way. Within the framework of HPSG, Avgustinova and Uszkoreit (2003) identified six types of copula constructions in Russian, only one of them (short adjectives, or adjectives which are lexically predicative) being given a marked analysis, while the rest receive the same representation, regardless of whether the copula is present or not, obligatory or not. The same tendency is expressed in the Minimalist approach by Adger and Ramchand (2003) where they analyzed the various copula constructions in Scottish Gaelic as having the underlying representation of Predicate Phrase (PredP).

The distribution of copulas varies crosslinguistically. We consider this distribution as a language-specific variation. Some languages use them along semantic lines, others along morpho-syntactic lines, others along lexical lines, etc., as will be shown in the next section.

3 Typological Divergences of Copula Constructions

Many languages have a copula verb that heads a copula construction, yet in many other languages constituents are merely juxtaposed and no copula verb is used. Typological studies (Curnow 2000, Pustet 2003) show that between these two poles there is a large spectrum of variation in the strategies used and constraints applied in the use of copula constructions. We will avail ourselves here of the increased attention the copula constructions have garnered in LFG and other syntactic theories, as well as typological studies. In this section we study the copula constructions in five languages in order to gain a better understanding of the phenomenon and observe the interesting variety in the choice of strategies used in this relationship.

The languages we choose to analyse are Arabic, Russian (Avgustinova and Uszkoreit 2003), Irish (Carnie 1997), Chinese (Tang 2001), and Scottish Gaelic (Adger and Ramchand 2003). These languages use divergent strategies and set various conditions on the construction of copula clauses. The main point we want to make in this section is that copula constructions use different strategies to encode essentially one and the same grammatical function.

Arabic uses different strategies to express the predicational relationship. The two elements (subject and predicate) are merely juxtaposed to express predicative and locational relations in the present tense, as in (6). When the predicate is an adjective it agrees with the subject in number and gender, as in (7)–(8).

(6) الرجل في الدار
ar-rağulu fī ad-dāri
the-man in the-house
‘The man is in the house.’

(7) الرجل كريم
ar-rağulu karīmun
the-man.sg.masc generous.sg.masc
‘The man is generous.’

(8) المرأة كريمة
al-marʾatu karīmatun
the-woman.sg.fem generous.sg.fem
‘The woman is generous.’

A pronominal must be inserted between the subject and the predicate in the equative relationships when both elements are definite, as in (9).

(9) أخي هو الطبيب
ʾaḫ-ī hwa aṭ-ṭabību
brother-my he the-doctor
‘My brother is the doctor.’

A copula verb is used in the past and future tenses, and also in the negated present, as shown in the examples in (10), (11) and (12) respectively.

(10) كان الرجل كريما
kāna ar-raǧulu karīman
was the-man generous
‘The man was generous.’

(11) سيكون التقرير جاهزا
sayakūnu at-taqrīru ǧāhizan
will-be the-report ready
‘The report will be ready.’

(12) ليس الرجل كريما
laisa ar-raǧulu karīman
is-not the-man generous
‘The man is not generous.’

Russian (examples from Avgustinova and Uszkoreit 2003) also employs various strategies. The Russian short adjective can only be used predicatively while its attributive use is not allowed. In the present tense the copula is not allowed with these adjectives, as in (13a), but must be used in the past and future tenses, as shown in (13b).

(13) a. On gord rezul’tatami.
he.NOM.SG.M proud.PRD-ADJ.SG.M results.INST.PL
‘He is proud of the results.’
b. On ne byl gord rezul’tatami.
he.NOM.SG.M not was proud.PRD-ADJ.SG.M results.INST.PL
‘He was not proud of the results.’

In the examples in (14) ordinary adjectives and nouns are used in predicative (ascription) constructions. The use of a copula verb in the present is unnatural while a copula must be used in the past and future tenses.

(14) a. On durak | tolstyj
he.NOM.SG.M fool.NOM.SG.M | fat.NOM.SG.M
‘He is a fool | fat.’
b. On byl durak | tolstyj
he.NOM.SG.M was fool.NOM.SG.M | fat.NOM.SG.M
‘He was a fool | fat.’

In the equative (identificational) construction, as shown in (15), an overt copula can be used in the present tense. But in the absence of a copula the left periphery must be separated from the right periphery intonationally by a pause and orthographically by a dash. Still the past and future must use overt copulas.

(15) a. On est’ brat Maksima.
he.NOM.SG.M is brother.NOM.SG.M Maxim.GEN
‘He is Maxim’s brother.’
b. On – brat Maksima.
he.NOM.SG.M brother.NOM.SG.M Maxim.GEN
‘He is Maxim’s brother.’

In the localization (locational and temporal), as shown in (16), predicational constructions the copula is unnatural in the present and is required in the past and future.

(16) Boris na sobranii.
Boris.NOM at meeting.LOC
'Boris is at a meeting.'

In predicational constructions denoting existence and possession, as shown in (17), the use of the copula is optional.

(17) a. Za uglom (est') magazine.
behind corner.SG.M.INST (is) store.NOM.SG.M
'There is a store around the corner.'
b. U Kati (est') samovar.
at Katia.GEN (is) samovar.NOM.SG.M
'Katia has a samovar.'

In modern Irish (examples from Carnie 1997) there are two types of copula constructions according to whether the relation is predicative or equative. In the predicative construction, as shown in (18a), the copula verb is followed by the predicate which is followed by an optional agreement morpheme, and the subject comes in the final position. In the equative construction, as shown in (18b), the copula is followed by an obligatory agreement morpheme which is followed by the subject and the predicate comes last.

(18) a. Is dochtúir (é) Seamus.
COMP doctor (AGR) Seamus
'Seamus is a doctor.'
b. Is é Seamus an captain.
COMP AGR Seamus the captain
'Seamus is the captain.'

From the above examples we notice that Irish has two different strategies (word order and the agreement morpheme) for encoding the copula construction according the two different semantic domains. The semantic distinction between equative and predicative gives a straightforward explanation of the differences in word order and obligatory vs. optional presence of the agreement morpheme in Irish.

In Chinese (examples from Tang 2001) the copula verb *shi* is optional in predicative sentences, as in (19), and obligatory in specificational and equative sentences, as in (20).

(19) Zhangsan (shi) Zhongguoren.
Zhangsan be Chinese
'Zhangsan is a Chinese.'
(20) Wo mai de *(shi) zhe duo hua. (specificational)
I buy DE be this Cl flower
'What I bought is this flowers.'

Moreover, predicative copula constructions are constrained by more detailed pragmatic considerations. In the example in (21) the predicate expresses the speaker's opinion or attitude and the clause is grammatical. Contrastively, the example in (22) expresses a fact and, therefore, the clause is considered unnatural or incomplete.

(21) Zhangsan shagua.
Zhangsan fool
'Zhangsan is a fool.'

(22) ??Zhangsan xuesheng.
Zhangsan student
'Zhangsan is a student.'

There are certain conditions that must be realized to make the predicate in (22) more natural. For example the predicate can be modified by an evaluative adjective, as in the example (23),

or specified by a noun in a compounding construction to make the predicate more complete, as shown in (24).

(23) Zhangsan hao xuesheng.
Zhangsan good student
'Zhangsan is a good student.'

(24) Zhangsan daxue sheng.
Zhangsan university student
'Zhangsan is a university student.'

Scottish Gaelic (examples from Adger and Ramchand 2003) shows, as well, interesting variations. A copula construction is formed from an AP or PP in the predicate position, as shown by the examples in (25) and (26) respectively.

(25) Tha Calum faiceallach.
Be-PRES Calum careful
'Calum is (being) careful.'

(26) Tha Calum anns a'bhùth.
Be-PRES Calum in the shop
'Calum is in the shop.'

However, when an NP is placed in the position of the predicate the construction is ungrammatical, as shown in (27), and a preposition is needed, as in (28), to make it grammatical. The preposition incorporates a pronoun which agrees with the subject. This is explained by Adger and Ramchand by the fact that APs and PPs denote eventuality (stage level), while NPs lack eventuality (individual level). This is why an expletive preposition is needed.

(27) *Tha Calum tidsear.
Be-PRES Calum teacher
'Calum is a teacher.'

(28) Tha Calum 'na thidsear.
Be-PRES Calum in+3sg teacher
'Calum is a teacher.'

In predicative constructions Scottish Gaelic can use an inverted structure where the predicate precedes the subject, as in (29).

(29) Is mòr an duine sin.
COP big that man
'That man is big.'

In equative constructions where a DP is used as a predicate, a third person masculine pronoun must be inserted after the copula, as in (30).

(30) 'S e Calum an tidsear
COP 3sg Calum (DP1) the teacher (DP2)
'Calum is the teacher.'

Adger and Ramchand (2003) assumed that the different forms of copula construction have essentially one underlying structure. They attribute the divergence in structure to the particular semantic specification of the predicate.

This survey shows how the interplay of syntax and semantics in the predicational constructions leads to the use of divergent strategies in the formation of copula clauses. Semantic considerations are significantly involved in the choice of the strategies employed in expressing the copula construction in many languages, or as Pustet (2003) puts it, "semantics conditions linguistic form". This tight relationship between syntax and semantics is also observed by Adger and Ramchand (2003):

> … there is an extremely tight relationship between the syntax and semantics of predication, and that semantic predication always feeds off a syntactic structure containing a predicational head. (Adger and Ramchand 2003, p. 325)

It also shows that the distribution of copulas varies crosslinguistically. This is a language-specific variation. Some languages use them along semantic lines, others along morpho-syntactic lines, others along lexical lines, etc.

4 Adjectives as a Hybrid Category

With regard to the predicational construction, adjectives have received more attention in LFG, as well as other theoretical frameworks, than any other constituent to the extent of blurring the predicational relationship itself. The short form predicative adjectives in Russian have been considered as predicators (Avgustinova and Uszkoreit 2003). They are also considered as the main head of the copula construction by Adger and Ramchand (2003). Similarly Nordlinger and Sadler (2006) draw evidence for the single-tier analysis of copula construction in LFG mainly from the behaviour of adjectives in some languages where they carry verbal morphology such as Abkhaz. Nevertheless they also emphasise that nominal predicates in some languages (such as Bininj Gun-wok) show verbal morphology.

Dalrymple et al. (2004) follow this trend and make a clear dichotomy between adjectives and other constituents in the predicate position by assuming that Japanese adjectives (where a copula is optional) function as the main head and subcategorize for the clausal subjects, whereas nouns (where a copula is always required) function as closed complements. Moreover they use agreement between predicative adjectives and subjects, as in the French examples in (31), as the main argument for the open complement analysis.

(31) Elle est petite.
she.fem.sg is small.fem.sg
'She is small.'

Therefore, we think that a special section on adjectives is motivated to account for the peculiar behaviour of adjectives and to put them in perspective to other constituents. We emphasise that adjectives have a special affinity to nouns within constructions whether they are used attributively or predicatively. This affinity does not obliterate their syntactic functions in the predicate position, or allow them to subcategorize for a subject.

Syntactic and typological studies have viewed adjectives as a category that falls in the middle between nouns and verbs. Bresnan (1995) proposed a set of tests to distinguish adjectives from verbs, and discussed the semantic and syntactic constraints that govern the conversion of verbs into adjectives. Beyssade and Dobrovie-Sorin (2005) on the other hand contrasted adjectives to nouns, stating that nouns denote sets of individuals while adjectives denote properties instantiated in individuals. Pustet (2003), in her typological study of the copula constructions, has viewed adjectives as a hybrid category, with both verbal and nominal characteristics.

To put adjectives in perspective, we need to view the relationship between the subject and the prototypical predicate as the relationship between a slot and filler, or analogically between a host and a guest. A host (analogous to the subject) can invite many guests (predicates), as illustrated in Table 1.

Host (subject)	Copula	Guest (predicate)
the idea	is	a shamble good out of date in my head that we need more time affording more money

Table 1. The host-guest relationship between the subject and the predicate

One of the guests (the adjective) shows a special affinity with the host. This affinity is revealed as they have matching qualities (agreement) and they are sometime seen together without an intruder (short adjectives in Russian forbid the use of a copula verb). This,

however, neither means that all other guests should be entangled in this affinity nor that the special guest is not a “guest”. This analogy means that the predicational relationship must be viewed across the board. All predicates stand in a functional predicational relationship to the subject as they all say something about the subject.

5 The single-tier analysis

We now turn to the details of the different approaches to dealing with copula constructions in LFG, and we are going to question their validity one by one. The first approach is the single-tier analysis. In this approach the predicate (or the copula complement) is taken to be the head of the construction that subcategorizes for a SUBJ. Dalrymple et al. (2004) stated that this is the chosen analysis for Japanese adjectives in the predicate position where a copula is optional. In this case the adjective is considered the head whether the copula is overt or non-overt. The examples in (32) both have the same f-structure as shown in Figure 6.

(32) a. hon wa akai
book red
‘The book is red.’
b. sono hon wa akai desu
this book red is
‘This book is red.’ (Dalrymple et al. 2004)

$$\begin{bmatrix} \text{PRED} & \text{‘red<(↑SUBJ)>’} \\ \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{‘book’} \end{bmatrix} \end{bmatrix}$$

Figure 6. Single-tier analysis of a Japanese copula sentence

On the other hand, with Japanese nouns the copula is required and therefore the copula complement cannot function as a subcategorizing head.

Dalrymple et al.’s (2004) argument for this analysis is that, as the copula is optional, the adjective provides the main PRED for the clause. They assumed that an adjective has a subcategorization power comparable to a verb.

> … the adjective is the syntactic head of the predicate phrase. If this is not considered a sufficient criterion for assuming that it subcategorizes for the (prototypical) subject of the sentence, then even the assumption that ordinary verbs subcategorize for subjects may be called into question. (Dalrymple et al. 2004, p. 191)

The main argument for the single tier-analysis in the case of Japanese sentences is that if the copula can be omitted then the complement is the head, and if the copula is required then the copula is the head. However, there are many reasons to counter this argument. First, this hypothesis fails to capture the generalization of the copular structure, and allows c-structure variations to penetrate into f-structure, which is supposed to give a deeper representation of the structure. We believe that it is important to view the syntactic position of the predicate in its totality. This position can be filled by an adjective, noun, preposition, adverb, or complement clause. Some constituents may have certain requirements, but the syntactic function is still the same.

Second, in our view, the presence vs. absence of a copula is not enough to motivate a divergent analysis for the same syntactic function. Copula use is conditioned in many languages according to numerous contexts; even in English the presence of the copula is not required in small clauses, such as the examples in (33).

(33) a. I consider him a monster.
b. I consider him to be a monster.

Predicates require overt/non-overt copulas depending on various criteria, such as the type of the constituent (adjective or noun, Japanese), tense (Arabic, Hebrew and Russian require an overt copula in the past and future), or formality (Japanese polite forms involve a copula). This shows that the requirement of an overt copula is triggered according to different conditions in different languages. So posing different syntactic representation fails to capture the generalization shared across these languages.

Third, while it is true that the adjective is a hybrid category (Pustet 2003), the verb has a deeply ingrained power to project onto the sentence structure in such a way that cannot be rivalled by any other lexical item. Verbs are the "inherent predicators" (Avgustinova and Uszkoreit 2003), and they are the uncontested predicators in the general case (Bresnan 1995). Moreover, verbs and adjectives function in basically different relationships. In the subject–predicate clauses the predicate gives information about the subject, while in the verb–subject clauses, there is a different set of relationships (e.g. agent, experiencer, theme, etc.) between the subject and the action.

Fourth, the predicate cannot be the head because it does not operate on the subject nor does it assign case to it. The evidence for this comes from Arabic. In Arabic, the verb assigns the nominative case to the subject and the accusative case to the object, and no other operator can override its power. Similarly, the preposition assigns the genitive case to the object, and no other operator can override its power either. However, in copula constructions the subject and predicate take the default case, i.e. the nominative case, as in (34). If the sentence is introduced by an affirmative particle, the subject takes the accusative case and the predicate remains unchanged, as in (35). When the sentence is introduced by the copula verb كان *kāna* 'was' the predicate takes the accusative case and the subject remains unchanged, as in (36). So, even though the subject and predicate remain adjacent, external operators can change their cases, which is not possible in any other governable relationship.

(34) الرجل كريم
ar-rağulu karīmun
the-man.nom generous.nom
'The man is generous.'

(35) إن الرجل كريم
ʾinna ar-rağula karīmun
indeed the-man.acc generous.nom
'The man is indeed generous.'

(36) كان الرجل كريما
kāna ar-rağulu karīman
was the-man.nom generous.acc
'The man was generous.'

Nordlinger and Sadler (2006) pose a more powerful motivation for the single-tier analysis, that is the case of predicates which carry verbal morphology. In some languages the predicates carry morphological features (such as tense, mood and aspect) that are normally indicated on verbs, but not on nouns. This is shown by the example from the Abkhaz language in (37) from Nordlinger and Sadler (2006).

(37) Də-psə́-w-p'.
3SG.SBJ-dead-PRES.DEL
'He is dead.'

Avgustinova and Uszkoreit (2003), in their HPSG analysis of the copula constructions in Russian, present an attitude that is similar to the single-tier analysis in LFG. They assume that Russian short adjectives are "lexically predicative non-verbal categories" that subcategorize for a subject. Short adjectives are distinct from all other constituents in two ways. First they are exclusively used as predicates, and their attributive use is ungrammatical. Second, an

overt copula is not allowed with short adjectives in the present tense. This is shown by the example from Russian in (38) from Avgustinova and Uszkoreit (2003).

(38) On gord rezul'tatami.
he.NOM.SG.M proud.PRD-ADJ.SG.M results.INST.PL
He is proud of the results.

Unlike Avgustinova and Uszkoreit (2003) who analysed the predicate as a subcategorizing head in a single case only (short adjectives) while giving a different analysis to all other copula constructions, Nordlinger and Sadler (2006) took the existence of verbal morphology on adjectives and nouns as evidence of the single-tier analysis in general, without restricting it to certain constituents or conditions.

In principle we need to allow grammatical functions to be expressed differently in different languages and in different contexts where there is a real motivation. For example, objects in one language can be rendered as obliques in another. Therefore we don't ague against Nordlinger and Sadler's (2006) analysis of the Abkhaz predicates which carry verbal morphology. The existence of verbal morphology on the predicate can be considered as enough motivation in our estimation to trigger a single-tier analysis. In this case we say that the predicate expresses itself in a specific language and in specific conditions as a subcategorizing head, while for the rest of the constituents the relationship is expressed as a subject-predicate binary relationship.

Regarding Avgustinova and Uszkoreit's (2003) analysis of short adjectives, we can counter their analysis with two arguments. First, the justification that short adjectives are used predicatively but not attributively may be motivated by semantic or pure lexical idiosyncrasies. Pustet (2003) points out that in English there are adjectives that cannot be used attributively, as in (39), as well as adjectives that cannot be used predicatively, as in (40).

(39) a. The man is ready.
b. * a ready man

(40) a. the former president
b. * The president is former.

In English also there is a whole class of adjectives that are restricted in their use. A participial adjective can serve in the attributive position but not the predicative position, as shown in the examples in (41) and (42). This can be explained as restrictions in the lexical properties of certain adjectives or structural constraints related to adjectival derivation, rather than representing different syntactic functions.

(41) a. an escaped prisoner
b. * the prisoner is escaped

(42) a. a fallen leaf
b. * the leaf is fallen

Second, the copula is used with short adjectives in the past and future tenses, as shown in (43) from Avgustinova and Uszkoreit (2003). This means that the short adjective's power as a main predicator is contested.

(43) On byl | budet gord rezul'tatami.
he.NOM was | will-be proud.PRD-ADJ.SG.M results.INST.PL
'He was | will be proud of the results.'

The strongest argument against the validity and general applicability of the single-tier analysis is put forward by Nordlinger and Sadler (2006), that is the case of tense stacking in languages such as Tariana, where there are two sets of tense affixes: one marking independent nominal tense, and the other marking propositional tense, as shown in (44).

(44) Pi-ya-dapana-miki-Ri-naka.
2SG-POSS-house-PST-NF-PRES.VIS
'This is what used to be your house (I can see it).'
(Tariana: Nordlinger and Sadler 2006 citing Aihkenvald 2003)

Nordlinger and Sadler (2006) emphasise that a single-tier analysis of such constructions will result in a conflict in the tense feature, and that it must be analysed as a double-tier construction where there are two levels of f-structure: one level stands as the locus of the nominal tense and the other level the locus of the propositional tense.

6 The double-tier open function analysis

Now we are going to investigate the second approach for analysing the copula constructions. The double-tier analysis is different from the single-tier analysis, as noted earlier, in that in the double-tier analysis the predicate is not considered as the clausal head, or main predicator. The predicator is either the copula, when it is present, or a higher structure (dummy predicate) when no copula is used. The open complement analysis assumes that the structure is subject to functional control. In this analysis the predicate selects for a subject which is controlled by the main subject of the sentence.

Dalrymple et al. (2004) consider that the open function XCOMP analysis is the chosen representation for languages where the predicate shows agreement with the subject, and cite the French example in (45) for which they proposed the f-structure reproduced as Figure 7.

(45) Elle est petite. (Dalrymple et al. 2004)
she.F.SG is small.F.SG
'She is small.'

$$\begin{bmatrix} \text{PRED} & \text{'be<(↑XCOMP)>(↑SUBJ)'} \\ \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{'she'} \\ \text{NUM} & \text{sg} \\ \text{GEND} & \text{fem} \end{bmatrix} 1 \\ \text{XCOMP} & \begin{bmatrix} \text{PRED} & \text{'small<(↑SUBJ)>'} \\ \text{SUBJ} & [\ ] 1 \end{bmatrix} \end{bmatrix}$$

Figure 7. An open complement f-structure of a French copula sentence

Dalrymple et al. argue that the motivation for this analysis is first that "the adjective simply agrees with its own SUBJ, in the same way as verbs do." Second, the XCOMP analysis allows us to write simple and standard control equations, as in (46) on the lexical entry of the adjective to specify the agreement features.

(46) petite (↑ PRED) = 'small <SUBJ> '
(↑ SUBJ NUM) =c sg
(↑ SUBJ GEND) =c fem

They maintained that the closed complement PREDLINK analysis, shown in Figure 8, will result in non-standard inside-out control equations, shown in (47).

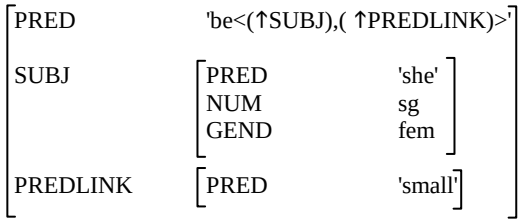

Figure 8. A closed complement f-structure of a French copula sentence

(47) petite (↑ PRED) = 'small'
((PREDLINK ↑) SUBJ NUM) =c sg
((PREDLINK ↑) SUBJ GEND) =c fem

Third, they assumed that "the XCOMP analysis allows for a much simpler analysis and one which is similar to that of other cases of subject-predicate agreement, such as subject-verb agreement."

Unfortunately, all of these motivations are questionable. First French adjectives do not agree in the same way as verbs. French verbs agree in person with their subjects while adjectives do not. Nevertheless, in our view, agreement alone is not enough to justify the claim that the predicate subcategorizes for the subject. Agreement is a relation that holds between a verb and subject, and also between a noun and adjective, a noun and relative pronoun, a noun and demonstrative pronoun, etc. Dalrymple et al. themselves questioned the feasibility of relying solely on agreement to justify an open function.

> In other languages, however, some considerations may weaken the status of agreement as an argument for assuming an XCOMP analysis. 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. Another issue is that predicative adjective agreement may be governed by semantic rather than syntactic features. (Dalrymple et al. 2004, p. 196)

It is quite reasonable to maintain that agreement between subject and predicate is governed by the semantics rather than the syntax. This is why the English example in (48b) is ungrammatical while the others are acceptable. This shows that agreement here is not captured merely through grammatical rules.

(48) a. They are doctors.
b. *They are a doctor.

(49) a. They are the cause of our trouble.
b. They are a big problem.

Second, simple standard equations can be written to specify the agreement relation without the inside-out non-standard ones, though we believe that how equations are written should not be a deciding factor in preferring a syntactic representation. However, the equation need not be written in the lexical entry of the adjective, as it is practically and theoretically implausible to say that the lexical entries of all adjectives and nouns subcategorize for subjects and that they agree with the subject. We adhere to Rosén's (1996) view that the relation between the subject and predicate is governed by the structure and so the agreement specifications must be written in the phrase structure rules.

> In Maori, the first NP is the predicative complement and the second is the subject. Since this information comes from the syntax and not from the lexicon, it might seem natural to let the phrase structure rule for this sentence type introduce a PRED that could subcategorize for these functions. (Rosén 1996)

As we adopt a constructional approach to the copula clauses, we believe that the agreement equation should be placed in the phrase structure instead, as in (50). In this rule the

disjunction "VCop ∨ ε" means that a copula sentence can have an overt or non-overt copula verb.

(50)

S →	NP	VCop	∨	ε	NP ∨ AP
	(↑ SUBJ)=↓	↑=↓		(↑ PRED)='null-be<SUBJ,PREDLINK>' (↑ TENSE)=pres	(↑ PREDLINK)=↓ (↓ GEND)=(↑ SUBJ GEND) (↓ NUM)=(↑ SUBJ NUM)

Third we do not need to analyse copula constructions in the same way as subject–verb constructions as they are syntactically, semantically and typologically different. They use different syntactic structures, cross-linguistically, to denote different sorts of relationships and semantic roles. We need to formalise the analysis of the predicational constructions instead of making them a subset of the subject–verb constructions. Subject–predicate constructions are fundamentally different from subject–verb constructions in the following ways.

1. They express relations rather than actions or events.
2. They are usually shorter.

> Verbless [copula-less] clauses differ from verbal clauses (apart from the use of the verb) chiefly in the number of constituents used. Verbal clauses often have, beside the verb and its subject, several constituents which modify the verb, and are related to each other only through their relationship to the verb. Verbless clauses are typically composed only of two constituents, which are in some way equated by the structure. (Revell 1989, p. 1)

3. They use a semantically void copula verb or no verb at all.

It has been the tradition of generative grammar to treat copula verbs as raising verbs (Adger and Ramchand 2003, Carnie 1997). However, we maintain that copula constructions are significantly distinct from raising constructions, and we even argue against the traditional treatment of raising verbs in LFG. We adopt Lødrup's (2006) distinction between raising verbs that can have verbal complements, such as *He seems to go*, and those that have non-verbal complements *He seems happy*. We further maintain that the two types of predications are totally different. While the verbal complement naturally selects for a subject and it is quite logical to treat it as a raising construction, it is hard to show that ADJPs, ADVPs, NPs and PPs can subcategorize for a subject. Our proposed analysis for raising verbs is to treat *seem* with non-verbal complements as a quasi-copula that links a subject and a predicate. The difference between *he seems to go* and *he seems happy* is the same as the difference between *he goes* and *he is happy* which are completely different syntactic structures. The first is a verbal construction while the second is a predicational construction.

The most compelling evidence against the general applicability of the open function comes from Dalrymple et al. (2004) who maintained that a closed complement analysis is mandated when the predicate already has a verb, such as the *that*-clauses, (51a); gerunds, (51b); and infinitival clauses, (51c) (examples from Dalrymple et al. 2004). In these instances the predicate already has a subject distinct from the subject of the main clause.

(51) a. The problem is that they appear.
b. The problem is their appearing.
c. The problem is (for them) to leave before 6.

They show that the XCOMP analysis requires the subject of the main clause to be the subject of the predicate, and this results in a clash, as shown in Figure 9.

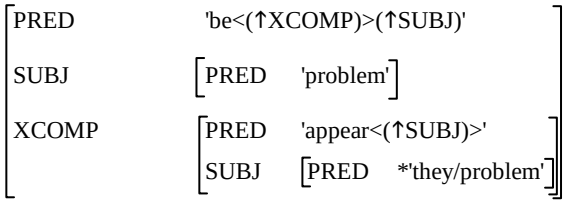

Figure 9. F-structure with a conflicting subject (Dalrymple et al. 2004)

Therefore a closed complement analysis, as shown in Figure 10, is compulsory to avoid this clash.

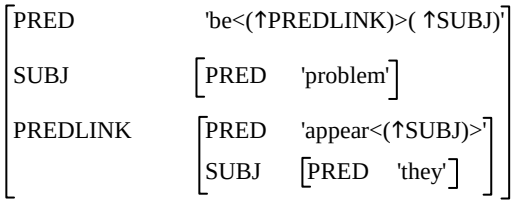

Figure 10. F-structure with a no conflict (Dalrymple et al. 2004)

7 The double-tier closed function as the chosen analysis

The double-tier closed function approach is a third possibility for analyzing the copula constructions in LFG. In our opinion this is the best possible representation as no serious challenges have been given against the general applicability of this analysis. We maintain that the closed complement analysis is the default syntactic representation for all languages. The presence vs. absence of a copula, presence vs. absence of agreement features on the predicate are all paradigmatic alternations that do not affect the syntactic function. The closed function analysis is also the only account which succeeds in providing a valid representation for all constituent types which take various semantic roles, as shown in Table 2.

Example	Constituent Type	Semantic Role
He is a doctor.	NP	Predicative
He is good.	Adjective	Predicative
He is here.	Adverb	Locational
He is in the garden.	PP	Locational
The meeting is tomorrow.	Adverb	Temporal
He is my father.	NP	Equative
The idea is that we need some time.	CP	Proposition

Table 2. Constituent types and semantic roles of copula complements

Only the closed function analysis allows for a unified account of the predicational phenomenon. Other accounts which assume that the predicative adjective is a head subcategorizing for the subject definitely find it harder to do so with other constituents such as NP and PP. Bresnan (2001) (cited by Lødrup 2006) proposes for sentences like (52) to manipulate lexical rules as in (53) to make nouns and prepositions subcategorize for subjects.

(52) a. The pills made him a monster.
b. She seems in a bad mood.

(53) a. 'monster' => 'be-a-monster<(↑ SUBJ)>'
b. 'in<(↑ OBJ)>' => 'be-in-state-of<(↑ SUBJ) (↑ OBJ)>'

This analysis, however, looks, in our opinion, too artificial and unnecessarily complex. Both Dalrymple et al. (2004) and Rosén (1996) agree on the fact that common nouns should not be considered as taking a subject in their argument structures.

> This [requiring a subject argument] does not seem implausible for adjectives, especially in languages such as French with adjectival agreement, but is less so for PPs and particularly for NPs. That is, it seems unlikely that every NP in a given language, regardless of the syntactic construction in which it appears, requires a subject. (Dalrymple et al. 2004, pp. 197-198)

> And in any case, this analysis [having the PRED of the NCOMP subcategorize for a SUBJ] would mean that all nouns would have to be subcategorized for subjects, which is certainly not desirable. (Rosén 1996)

It is noteworthy that in the Penn English Treebank (PTB) (Marcus, et al. 1994), small clauses are considered as sentences which are composed of a subject and a predicate, with no traces for an omitted verb or any sort of control relationship, as shown in the example in (54).

(54) (S (NP-SBJ I)
(VP consider
(S (NP-SBJ Kris)
(NP-PRD a fool))))

The team working on the Penn Arabic Treebank found this approach very convenient and satisfactorily representative of the copula constructions in Arabic, which is mainly verbless (Maamouri and Bies 2004). Therefore they used a similar analysis with no assumption of a deleted copula verb or control relationship, as shown in the example in (55).

(55) (S (NP-SBJ Al-mas>alatu المسألة)
(ADJ-PRD basiyTatuN بسيطة))

المسألة بسيطة
al-masʾalatu basīṭatun
The question is simple.

The closed complement analysis is also the most intuitive representation for verbless constructions. A large number of languages do not use a copula verb to express the predicational relationship.

> The class of languages which contain be-less sentences is widespread; it includes languages from practically every language family and from every continent. (Carnie 1995, p. 251)

In the analysis of copula-less languages we do not assume that a copula verb is elided, we consider that the relationship is intrinsically expressed merely by juxtaposing the constituents. In Maori a copula verb is never used, but the relationship is expressed by the grammatical construction as a whole (Rosén 1996). Therefore constituents are not related through a verb, either overt or non-overt, but through the structure of the clause, as further emphasized by Butts (2006) for Aramaic.

> Nexus can be expressed, however, by means other than a finite verb. In Aramaic, the verbless clause, that is, a clause lacking a finite verb as core constituent, is defined as a clause in which nexus is expressed not by a finite verb, but by the syntactical juxtaposition of subject and predicate. (Butts 2006, p. 56)

In our analysis, we do not make any functional distinction between copula and copula-less constructions, as they are semantically and functionally equivalent.

> … verbless constructions … are generally functionally equivalent (or at least, in functional overlap with) with copula constructions in other languages (or even within the same language). (Nordlinger and Sadler 2006)

The presence or absence of a copula is a parameter of variation. The copula itself is considered semantically redundant. In the typological and syntactic literature the copula verb has been described as “light”, “bleached” and “semantically void”.

We adopt Nordlinger and Sadler’s (2006) account of the copula-less construction as involving a higher structure. They argue that the main predicator is not an elided copula but a more hierarchical structure that governs the whole sentence:

> … these verbless clauses have a more hierarchical f-structure in which the f-structure of the non-verbal predicate functions as an argument within a higher f-structure which itself has a PRED, but where there is no overt syntactic element corresponding to this predicate in the c-structure. (Nordlinger and Sadler 2006)

So we consider that the main predicator is “null-be” without the assumption that there is an elided *be*-like verb. In many languages the mere juxtaposition of subjects and predicates is enough to express the predicational relationship. Further, it might be asked why a predicator is needed after all. The answer is that we need a predicator not only to satisfy the coherence condition in LFG, but also to state the fact that a grammatical sentence is composed of a subject and a predicate, nothing more, nothing less. A predicator is also needed to convey sentential information such as tense and negation. So for the Arabic example in (56) we have the phrase structure rules in (57) and the f-structure in Figure 11.

(56) هو طالب
hwa ṭālibun
he student
‘He is a student.’

(57) $S \rightarrow$ NP (↑ SUBJ)=↓ ε (↑ PRED)='null-be<SUBJ,PREDLINK>' (↑ TENSE)=pres NP ∨ AP (↑ PREDLINK)=↓ (↓ GEND)=(↑ SUBJ GEND) (↓ NUM)=(↑ SUBJ NUM)

$$\begin{bmatrix} \text{PRED} & \text{'null-be<(↑SUBJ) (↑PREDLINK)> '} \\ \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{'he'} \end{bmatrix} \\ \text{PREDLINK} & \begin{bmatrix} \text{PRED} & \text{'student'} \end{bmatrix} \\ \text{TENSE} & \text{present} \end{bmatrix}$$

Figure 11. F-structure of an Arabic copula sentence

We also consider that PREDLINK should be included in the inventory of grammatical functions that denote the subject and predicate in the universally acknowledged predicational construction.

We must emphasize that our argument is that the closed function analysis can be considered as the default analysis as it accounts for a large range of the spectrum of copula complements. This, however, does not mean that it is the only possible analysis. There are special cases where the single-tier is perfectly motivated, as in Nordlinger and Sadler's (2006) account of the single-tier analysis for languages where the NP/AP carries verbal morphology.

8 Conclusion

We conclude that a unified analysis of copula constructions is motivated. The different strategies employed in the predicational structures are language-specific variations that basically express the same grammatical function. We assume that the copula complement is a closed function, i.e. PREDLINK. This analysis can serve as a “boilerplate” strategy that can account for all the different constituents that can occupy the predicate position and express cross-linguistic generalizations pertinent to the functional use of copula constructions. We

have discussed the other two analyses (single tier and open function) and showed their inadequacies in handling the different types of copula constructions.

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