On the Copula, Specificational Constructions and Type Shifting*

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Comments welcome!

Abstract

This paper discusses copula constructions in English, German, and Danish and argues that a uniform analysis of all copula constructions is inappropriate. We provide evidence from German that there should be a raising variant of the copula in addition to an identificational copula. The raising version of the copula does not contribute semantically contrary to Montague and Van Eynde. Rather a unary schema is provided that maps referential NPs that can be used as arguments onto predicational NPs. Data from Danish shows that predicational NPs can be subjects in specificational structures. An account for such specificational structures is provided and the different behaviour of predicational and specificational structures with regard to question tags is explained. A similar contrast can be found in German left dislocation structures, which follows from the assumptions made in this paper.

A modified treatment of complex predicate formation allows for a reduction of selectional features in HPSG (that is abolishing of XCOMP or VCOMP) and for a uniform treatment of predicational phrases in copula constructions and resultative secondary predicates. This yields an account for constituent order variants that remained unexplained by earlier analyses.

1 The Phenomenon

Research on copula structures has a long tradition (see Mikkelsen, 2011 for an overview). One important question is the question of how many copulas are needed for the observ-

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able syntactic patterns and the respective meanings that can be expressed. We follow recent research in assuming that there are basically three types of copula constructions: equational, specificational and predicational constructions, two of which are order variants of each other (Section 1.1). Section 1.2 discusses V2 languages like Danish and German and compares English and Danish to German, which has rather free constituent order in general. We show that all three languages have means to distinguish referential from predicational elements (question tags and/or left dislocation) and argue that there is no way to identify specificational structures in German. Section 1.3 discusses constraints on specificational constructions in Englisch and Danish. Section 1.4 provides an additional test for differentiating between referential and predicative NPs. Section 1.5 shows that one of the copula constructions is a raising construction and Section 1.6 discusses the formation of predicate complexes.

After the description of the phenomenon, we turn to the analysis in Section 2 and to the discussion of previous approaches in Section 3.

1.1 Equational, Predicational, and Specificational Constructions

Recent research on predication distinguishes three types of copula structures: equational, predicational, and specificational structures (Mikkelsen, 2011, Section 2). In equational structures two expressions of the same type are equated. Examples of this type are given in (1):

(1) a. Cicero is Tully.
b. That woman must be her.
c. Honest is honest.

In (1a) two proper nouns are equated: that is, it is expressed that the referents of the two referential NPs are identical. Similarly, two pronouns are equated in (1b) and two adjectives in (1c).

Mikkelsen gives the following examples for predicational constructions:

(2) a. Harvey/my brother/the guest of honor/she/everyone/noone was [happy].
b. Sylvia is [from Seattle].
c. Sylvia is [an architect].
d. Sylvia is [the architect on that project].
e. Sylvia is [my friend].
f. Sylvia is [mayor of Seattle].

As the examples show, the predicate complement can be an AP, PP, NP or a noun with a complement. Mikkelsen (2011, 1809) claims that (2f) is an instance of an $\overline{\text{N}}$ predicate (NP in her terminology), but the class of such predicates is smaller: It is basically nouns with their complements, but without modifiers:[1]

[1] Examples like (i) can be constructed though.

(i) He was elected president for over 20 years before having to resign due to misconduct.

Examples like (ii) can be easily found in corpora:

(3) * He is new mayor of Seattle.

In English there seems to be a uniqueness restriction on determinerless predication. Sentences like those in (4) are ungrammatical:

(4) * He is senator/teacher.

In comparison, the equivalents of (4) are possible in German:

(5) Er ist Lehrer.
he is teacher
'He is a teacher.'

The modification by adjectives is ungrammatical in many cases, but examples like (iii) in footnote show that such cases cannot be ruled out by a general rule. (6a) provides an example that is unacceptable for me, but many examples of the type in (6b) can be found in which the predicational NP contains postnominal modifiers:

(6) a. * Er ist neuer Lehrer.
he is new teacher

b. In Hogwarts gibt es Neues. Der egozentrische Schönling Gilderoy
in Hogwarts gives it new the egocentric beau Gilderoy
Lockhart (Kenneth Branagh) ist neuer Lehrer in „Verteidigung gegen
Lockhart Kenneth Branagh is new teacher in defense against
die dunklen Künste"[2]
the dark arts
'There is news from Hogwarts. The egocentric beau Gilderoy Lockhart
(Kenneth Branagh) is the new teacher in Defense Against the Dark Arts.'

As Mikkelsen (2005, 70–72) points out, question tags agree with the subject in predicational constructions in gender as they do in non-predicational structures:

(7) a. The guest of honor was happy, wasn't she/he/*it?

b. The guest of honor spoke after dinner, didn't she/he/*it?

Apart from equational and predicative constructions a third type is identified in the literature. Mikkelsen gives the following example for what she calls a specificational construction:

(ii) Former Leftist Rebel Is Elected Mayor of Bogotá (WSJ, 30.10.2011)

However these examples have a reading in which *elected* is the passive participle rather than the adjectival participle modifying *mayor*. The example in (i) was handcrafted by Philippa Cook and its most plausible reading is the one in which *elected* modifies *president*. The situation is clearer for languages like German where constituent order is unambiguous and prenominal adjectives are inflected:

(iii) Peter-André Alt ist gewählter Präsident (Tagesspiegel-Beilage vom 29.05.2010)
http://www.fu-berlin.de/presse/publikationen/tsp/2010/ts_20100529/ts_20100529_12/.
20.12.2012.

See Section 2.3 for a suggestion how such cases can be accommodated.

[2] http://www.mucke-und-mehr.de/kino/potter2.htm. 04.01.2013.

(8) a. The director of *Anatomy of a Murder* is Otto Preminger, isn't it?
b. The director of *Anatomy of a Murder*, that's Otto Preminger.

Here the post-copular NP is a proper name, that is, clearly referential. The pre-copular constituent contributes the predication. Interestingly, the pronoun *it* is used in question tags and the pronoun *that* in left dislocation structures.[3] This test shows that the subject in (8) is not referential, but rather predicational. Specificational structures can be regarded as a variant of predicational structures with the predicational NP realized in pre-copula position.

While predicational structures are possible with verbs like *consider*, specificational and equational structures require the copula to be present (Rothstein, 1995, 32):

(9) a. I consider [Sylvia my best friend]. (predicational)
b. I consider [my best friend *(to be) Sylvia]. (specificational)
c. I believe [that/her *(to be) Sylvia]. (equational)

1.2 German, English, Danish: Specificational Constructions, Question Tags, and Left Dislocation

Evidence from question tags was used to argue for a special type of copula construction in English: Specificational constructions. The situation is more complicated in a language like Danish: Danish is a V2 language, so the orders with a predicative element in pre-copula position could be derived by fronting the predicate rather than the subject of a canonical predicational construction. However, there is a test that helps to identify which element is the subject (Jespersen, 1924, 153, fn. 2, Mikkelsen 2002, 2005): The negation attaches to the VP. For subordinate and main clauses we get the following structures:

(10) a. subject negation verb complements (subordinate)
b. verb subject negation complements (main clause, V1)

A V2 clause is derived from (10b) by fronting one constituent. Given this background we can show that Danish also has specificational structures in which the subject of the clause is the predicate. Since the post-negation position in (11b) is filled by *Max*, *vinderen* has to be extracted from the pre-negation position and hence, it has to be the subject of the clause.

[3] That predicational elements require different pronouns than referential ones was also noted by Williams (1983, 426) with respect to the interrogative pronoun *what*. If *what* is used to refer to referential NPs it is restricted to inanimate ones (i.a), while it is not restricted when it refers to predicative NPs as in (i.b):

(i) a. ? What did John talk to?
John talked to a doctor/?a rock
b. What did John become?
John became a doctor/?a rock

See also Rieppel, 2012, 3, 6 on using *what* and *who* to differentiate between predicational and equational constructions.

(11) a. Max$_i$ er $\__i$ ikke vinderen, er han vel. (Max= Subj, vinderen = Comp)
Max is not winner.DEF is he not
'Max is not the winner.'

b. Vinderen$_i$ er $\__i$ ikke Max, er det vel. (Max= Comp, vinderen = Subj)
winner.DEF is not Max is it not

c. Vinderen$_i$ er Max ikke $\__i$, er han vel. (Max= Subj, vinderen = Comp)
winner.DEF is Max not is he not

Note that this also corresponds to the question tags used in the sentences.

German differs from both English and Danish in being a language with rather free constituent order, so a test like the position of negation cannot be used for German. However, predicative elements can still be distinguished from referential ones: In left dislocation structures *das* ('that') is used for predicational elements and the gender agreeing *der/die/das* for referential elements.

(12) a. Klug / ein Mörder, das / *der ist Peter. (predicational element)
smart a murderer that that is Peter
'Peter is smart / a murderer.'

b. Ja, aber Peter, der ist ein Mörder, nicht Klaus. (referential element)
Yes, but Peter that is a murderer not Klaus
'Yes, but Peter is a murderer, not Klaus.'

The discussion in this subsection shows that we have means to distinguish predicational and specificational structures in languages like Danish and English, which have a rather restricted constituent order otherwise. For German this distinction cannot be made, since the language allows for the reordering of subject and complements anyway. So, this leaves us with two types of copula constructions for languages like German: equational and predicational constructions.

1.3 Constraints on Specificational Structures

As was pointed out by Gerbl (2007, 102, 190–191) for English, the post-copular element cannot be extracted from specificational structures. We provide Danish examples in (13): while the extraction of objects and predicates in postverbal position is possible in Danish (13a,b), the extraction of the post-copula element in specificational constructions like (13c) is ungrammatical (13d).

(13) a. Bogen$_i$ tror han, at Max læser $\__i$.
book.DEF thinks he that Max reads
'He thinks that Max reads the book.'

b. Klog$_i$ tror han, at Max er $\__i$.
smart thinks he that Max is
'He thinks that Max is smart.'

c. Han tror, at vinderen er Max.
he thinks that winner.DEF is Max
'He thinks that the winner is Max.'

d. * Max$_i$ tror han, at vinderen er $\_{}_i$.
Max thinks he that winner.DEF is
'He thinks that the winner is Max.'

This has interesting consequences for V2 sentences, since it avoids spurious ambiguities: The prohibition of extraction out of and of the post-copular element ensures that there is just one structure for (14):

(14) Max er vinderen.
Max is winner.DEF
'Max is the winner.'

Without this constraint (14) could be a specificational construction with the structure in (15):

(15) Max$_i$ [er$_j$ [$_{\text{S}}$ vinderen [$_{\text{VP}}$ $\_{}_j$ $\_{}_i$]]].

Max would be the extracted complement of the (moved) copula ($\_{}_j$) and *vinderen* would be the specifier. Since the extraction of the underlying subject is prohibited, (15) is ruled out and the only legitimite structure for (14) is the predicational one in (16):

(16) Max$_i$ [er$_j$ [$_{\text{S}}$ $\_{}_i$ [$_{\text{VP}}$ $\_{}_j$ vinderen]]].

1.4 Predicative vs. Referential NPs

Some authors (Quine, 1960; Montague, 1974, 261; Van Eynde, 2008, 2009, 2012) argue that the copula relates two referential NPs. We already saw in Section 1.2 that predicational NPs require different pronouns in question tags, left dislocation structures, and questions. Rieppel (2012) found another test that makes it possible to differentiate between predicative and non-predicative NPs. Predicative elements can be coordinated as (17a) and (17b) show. *the greatest French soldier* in (17b) is a predicative element just like the adjective *vindicitive* in (17a). However, (17c) is ungrammatical and this is due to the difference in function: *Napoleon* is a referential NP rather than a predicative one and cannot be coordinated with the predicative phrases.

(17) a. He is clever, audacious, and [vindictive].
b. He is clever, audacious, and [the greatest French soldier].
c. * He is clever, audacious, and [Napoleon].

1.5 Raising

The predicative copula is usually analyzed as a raising predicate that does not contribute semantically, except for tense information in the case of finite forms of the copula (Frege 1892, 194; Paul 1919, 41; Higginbotham 2005, 355).[4] One property of raising verbs is that they are not sensitive to the kind and/or number of their arguments, for instance they allow for expletive subjects, which is – of course – compatible with

[4]For a discussion of alternative proposals by Quine, Montague, and Van Eynde see Section 3.2.

the fact that they do not assign semantic roles to their arguments. An example for an adjective that allows for an expletive subject is *laut* ('loud'):

(18) In der Mensa ist es laut.
in the commons is it.EXPL loud
'It is loud in the commons.'

The adjective *laut* also has a non-expletive version, and (18) is actually ambiguous between the expletive and the non-expletive reading. With the expletive predicate, (18) means that the people, machines, or whatever, in the commons are loud, whereas in the non-expletive reading the *es* ('it') could refer to a child.

German is a language that has subjectless verbs and adjectives. Müller (2002, 72–73) discusses the following examples:[5]

(19) a. weil schulfrei ist
because school.free is
'because there is no school'

b. weil ihm schlecht ist
because him.DAT bad is
'because he is sick'

c. Für dich ist immer offen.
for you is always open
'It is always open for you.'

Again such data is consistent with a raising analysis that raises the subject of an embedded predicate if there is one but does not rule out embedded predicates that do not have a subject at all.

1.6 Predicate Complex Formation

Certain verbs form a predicate complex in languages like German, Dutch, Persian, and Hindi. The arguments of the verbs that are involved in complex formation can be scrambled according to the general rules of the respective language. In addition parts of the predicate complex can be fronted while arguments of the fronted heads may be left behind. Adjuncts in pre-complex position can scope over different elements of the predicate complex. An industrial-strength overview of the phenomenon in German can be found in Bech, 1955. Bech coined the term coherent construction for verbal complexes. Analyses of the data in the framework of Transformational Grammar/GB can be found for instance in Evers, 1975, Haider, 1993, Chapter 9, G. Müller, 1998 and HPSG analyses can be found in Hinrichs and Nakazawa, 1989, 1994, Kiss, 1995, Meurers, 2000, Kathol, 2000, and Müller 1999, Chapter 14, 17, 18, and 2002, Chapter 2 for German, in Rentier, 1994 and Bouma and van Noord, 1998 for Dutch, Chung, 1993 for Korean, and Müller, 2010, Section 5.4 for Persian. Müller (2002, Chapter 2) extended the verb complex analysis to verb adjective combinations. Since the focus of this paper is predicational constructions, we exclusively discuss copula constructions and other predicational structures here.

[5](19c) is quoted from Haider, 1986, 18.

As within coherent combinations of verbs, different scopings can also be observed in copula constructions:

(20) weil ihr der Mann immer treu sein wollte
because her.DAT the man.NOM always faithful be wanted.to
'because the man always wanted to be faithful to her'
'because the man wanted to be always faithful to her'

The sentence in (20) has the two readings that are indicated in the translation, but here the situation is less clear since the two readings may be due to the ambiguity between the modification of the copula and the modal. However, there are sentences like (21) where the adjective is fronted together with the adverbial.

(21) Immer treu wollte er ihr sein.
always faithful wanted.to he.NOM her.DAT be
'He wanted to be faithful to her forever.'

Due to the existence of such sentences, the possibility of adverbs modifying adjectives directly cannot be ruled out in general. Note furthermore, that the sentence in (21) is not ambiguous. The reason for this is that *immer treu* forms one topological unit and adverbials in this unit cannot scope over verbs or adjuncts in other topological units.

So, while it is not entirely clear whether the two readings of (20) are due to the attachment of the adverbial to the two verbs rather than to the adjective and the modal, it is clear that the phrase *ihr immer treu* in (20) and (22) cannot be a closed AP in the wide scope reading since then the scoping of the adverb over a predicate outside the domain of the AP could not be explained.

(22) weil der Mann ihr immer treu sein wollte
because the man.NOM her.DAT always faithful be wanted.to
'because the man always wanted to be faithful to her'
'because the man wanted to be faithful to her forever'

The example in (20) also shows that the subject of the adjective, which is also the subject of the modal, can appear between the adjective and its complement (*ihr* ('her')). The alternative order in (22) is also possible. See also den Besten, 1985, 60 on this point.

The examples discussed so far show that copula constructions with adjectives fulfill the criteria for so-called coherent constructions: Adjuncts can scope over predicates in the predicate complex, predicates can be fronted without their arguments, arguments of several heads can be scrambled with respect to each other. However, Müller (2002, 69) pointed out that there are also examples that are reminiscent of incoherent constructions: In (23) the adjectives are not adjacent to the copula but intraposed in the Mittelfeld:

(23) a. Sie wuchsen in einem gesellschaftlichen Klima auf, das *freier* in
they grew in a social climate PART(up) that freer in
Deutschland nie *war*.[6]
Germany never was
'They grew up in a social climate that was freer than ever in Germany.'

[6] taz, 01.07.1995, 10.

b. daß *ausschlaggebend für die Interpretation abgeleiteter Verben*
that decisive for the interpretation derived verbs
bestimmte semantische Interpretationsmuster *sind*, die sich
certain semantic interpretation.models are which self
[...][7]

'that certain semantic interpretation models that are [...] are decisive for the interpretation of derived verbs'

Due to space limitations the discussion of the data remains sketchy here, but a thorough discussion of the data can be found in Müller, 2002, Chapter 2.1.9.

Müller (2002, Chapter 2.2.7) focussed on adjectival predication, but of course the copula can be combined with predicative NPs and PPs as well. In contrast to adjectival predication, predicative NPs and PPs do not enter the predicate complex in the sense that the noun or preposition forms a complex with the copula. Instead nouns and prepositions that are used predicatively have to form full phrases and hence can be intraposed (that is, scrambled) (Hoberg, 1981, 92; Müller, 1999, 173):

(24) a. Auch bei Newton war der entscheidende Schritt die Erkenntnis gewesen,
also at Newton was the deceicive step the insight been
daß ...[8]
that
'The insight that [...] was the deceicive step for Newton too.'

b. wiegen wir uns heute in dem Glauben, daß das Happening wir sind.[9]
rock we us today in the believe that the happening we are
'we lull ourself into believing today that we are the happening'

This section showed that predicative constructions can take part in cluster formation (primary and resultative predication with adjectives) but that there are also cases in which no complex formation takes place (primary predication with NPs and PPs, and resultative predication with PPs). An analysis should provide a unified account of these phenomena.

2 The Analysis

The analysis will be developed in the framework of HPSG (Pollard and Sag, 1994). The following section provides some background information that is needed to be able to understand the analysis.

2.1 Background

HPSG is a sign-based theory in the sense of Saussure (1916): all linguistic objects are form-meaning pairs. Linguistic objects are modelled by typed feature structures that

[7] In the main text of Kaufmann, 1995, *Konzeptuelle Grundlagen semantischer Dekompositionsstrukturen*, 162.

[8] Hoberg, 1981, 92.

[9] taz berlin, 10.07.98, p. 26.

consists of feature value pairs. (25) shows parts of the lexical item for *Frau* ('woman'). The first feature value pair describes the phonological form of the word. The value of

(25)
$$\begin{bmatrix} \text{PHONOLOGY} \langle \textit{frau} \rangle \\ \text{SYNTAX-SEMANTICS} \begin{bmatrix} \text{LOCAL} \begin{bmatrix} \text{CATEGORY} \begin{bmatrix} \text{HEAD} \ \textit{noun} \\ \text{SPR} \ \langle \text{DET} \rangle \\ \textit{category} \end{bmatrix} \\ \text{CONTENT} \ \ldots \\ \textit{local} \end{bmatrix} \\ \text{NONLOCAL} \ \ldots \\ \textit{synsem} \end{bmatrix} \\ \textit{word} \end{bmatrix}$$

PHON is a list of phonemes. For reasons of readability usually the orthographic form is given in HPSG papers and phonological structure is omitted. The second feature is SYNTAX-SEMANTICS (SYNSEM) and its value is a description of all properties of a linguistic object that are syntactically and semantically relevant and can be selected by other heads. Information that is locally relevant (LOCAL) is distinguished from information that plays a role in non-local dependencies (NONLOCAL). Syntactic information is represented under CATEGORY (CAT) and semantic information under CONTENT (CONT). The example shows the HEAD value, which provides information about all aspects that are relevant for the external distribution of a maximal projection of a lexical head. In particular the part of speech information (*noun*) is represented under HEAD. As well as information regarding the head features, valence information also belongs under CAT. The example shows the SPR feature, which is used for the selection of a specifier. The following section deals with valence and the role of features like SPR.

2.1.1 Valence and Constituent Order

Valence Descriptions of lexical elements contain a list with descriptions of the syntactic and semantic properties of their arguments. This list is called Argument Structure (ARG-ST). (26) gives some prototypical examples for ARG-ST values.

(26)

Verb	ARG-ST	SPR	COMPS
sleeps	⟨ NP[*nom*] ⟩	⟨ NP[*nom*] ⟩	⟨ ⟩
chases	⟨ NP[*nom*], NP[*acc*] ⟩	⟨ NP[*nom*] ⟩	⟨ NP[*acc*] ⟩
talks	⟨ NP[*nom*], PP[*about*] ⟩	⟨ NP[*nom*] ⟩	⟨ PP[*about*] ⟩
gives	⟨ NP[*nom*], NP[*acc*], NP[*acc*] ⟩	⟨ NP[*nom*] ⟩	⟨ NP[*acc*], NP[*acc*] ⟩

In (26) items like NP[*nom*] are abbreviations that stand for feature descriptions. The elements in the ARG-ST list are ordered according to the obliqueness hierarchy suggested by Keenan and Comrie (1977).

SUBJECT => DIRECT OBJECT => INDIRECT OBJECT => OBLIQUES => GENITIVES => OBJECTS OF COMPARISON

In grammars of configurational languages like English, the ARG-ST list is mapped onto two valence features: SPR and COMPS. Examples for the respective values are also given in (26). We assume that Danish is a configurational language as well and hence the arguments will be mapped to SPR and COMPS as in the examples given above. The evidence for such a treatment is discussed in Müller and Ørsnes, In Preparation, Chapter 4.

The HPSG representation of valence is reminiscent of Categorial Grammar (Ajdukiewicz, 1935) where each head comes with a description of its arguments. Figure 1 shows the saturation of the specifier valence: A head that requires a specifier can be combined with a subject that matches the description in the SPR list. The $\boxed{1}$ indicates that the properties of the subject NP and its description in the SPR list are identified (structure shared). Therefore accusative NPs like *him* are excluded as a subject of *sleeps*. The elements in valence lists are canceled off once the combination with an

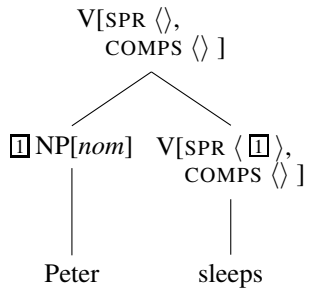

Figure 1: Analysis for *Peter sleeps.*

appropriate item has taken place, that is the SPR list of *Peter sleeps* is empty since the SPR element of *sleeps* is realized as a sister of *sleeps*. Figure 2 shows a more complex example with a transitive verb. *chases* and *some cat* form a VP (a verbal projection

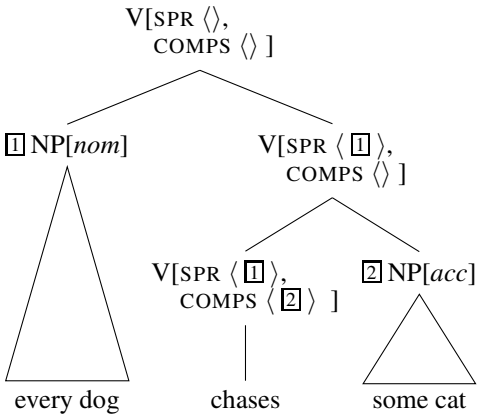

Figure 2: Analysis for *Every dog chases some cat.*

with an empty COMPS list) and this VP is combined with its subject to form a fully saturated verbal projection, that is, a clause.

Constituent Structure HPSG exclusively uses feature structures with structure sharing and relational constraints for modeling linguistic objects. As a consequence of this the theory does not use phrase structure rules. Instead the dominance relation between linguistic objects is modeled with feature structures. Trees are used for visualization purposes only. The attribute value matrice that represents the dominance relations in the tree in Figure 3 is shown in (27).

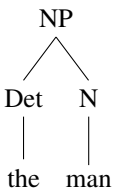

Figure 3: *the man*

(27)
$$\begin{bmatrix} \text{PHON} & \langle\, \textit{the man} \,\rangle \\ \text{HEAD-DTR} & \begin{bmatrix} \text{PHON} \ \langle\, \textit{man} \,\rangle \end{bmatrix} \\ \text{NON-HEAD-DTRS} & \left\langle \begin{bmatrix} \text{PHON} \ \langle\, \textit{the} \,\rangle \end{bmatrix} \right\rangle \end{bmatrix}$$

For explanatory purposes (27) shows the phonological information only. Part of speech information and valence information that is contained in the tree in Figure 3 is omitted. The value of PHON gives a list of phonological contributions of the daughter signs. The feature HEAD-DTR is appropriate for headed structures. Its value is the sign that contains the head of a complex expression (the verb in a VP, the VP in a clause). The value of NON-HEAD-DTRS is a list of all other daughters of a sign.

The following implication shows the constraints that hold for structures of type *head-complement-phrase*:

Schema 1 (Head-Complement-Schema (fixed order))
head-complement-phrase $\Rightarrow$
$$\begin{bmatrix} \text{SYNSEM}|\text{LOC}|\text{CAT}|\text{COMPS} \ \boxed{1} \\ \text{HEAD-DTR}|\text{SYNSEM}|\text{LOC}|\text{CAT}|\text{COMPS} \ \langle\, \boxed{2} \,\rangle \oplus \boxed{1} \\ \text{NON-HEAD-DTRS} \ \left\langle \begin{bmatrix} \text{SYNSEM} \ \boxed{2} \end{bmatrix} \right\rangle \end{bmatrix}$$

This constraint splits the COMPS list of the head daughter into two parts: a list that contains exactly one element ($\langle\, \boxed{2} \,\rangle$) and a remaining list ($\boxed{1}$). The first element of the COMPS list is identified with the SYNSEM value of the non-head daughter. It is

therefore ensured that the description of the properties of the complement of a transitive verb like *chases* in Figure 2 is identified with the feature value bundle that corresponds to the properties of the object that is combined with the head (*some cat* in the case of Figure 2). Since Schema 1 licenses structures with exactly one head daughter and exactly one non-head daughter, structures will be binary. This is not the only option for defining head complement structures but we assume binary branching structures here.

The Schema 1 licences the VP *chases some cat* in Figure 2. The combination of the VP and its specifier is licenced by the Specifier-Head-Schema:

Schema 2 (Specifier-Head-Schema)
head-specifier-phrase ⇒

$$\begin{bmatrix} \text{SYNSEM}|\text{LOC}|\text{CAT}|\text{SPR } \boxed{1} \\ \text{HEAD-DTR}|\text{SYNSEM}|\text{LOC}|\text{CAT}|\text{SPR } \boxed{1} \oplus \langle \boxed{2} \rangle \\ \text{NON-HEAD-DTRS } \langle [\text{ SYNSEM } \boxed{2} \text{ }] \rangle \end{bmatrix}$$

This schema also licences the combination of nominal projections with a determiner.

Free Constituent Order Languages Schema 1 allows for the combination of a head with its complements in a fixed order (similar to what is known from Categorial Grammar). Taken together with a linearization constraint that orders a head before its arguments, this results in a fixed constituent order in which the verb preceeds its complements and the complements are serialized according to their obliqueness. However there are languages with much freer constituent order than English. If one does not want to assume a base order from which other orders are derived by movement or equivalents to movement one has to find ways to relax the constraint on head complement structures. One way of doing this is to allow the non-head daughter to be an arbitrary element from the COMPS list of the head daughter. The respective modification of Schema 1 is given as Schema 3:

Schema 3 (Head-Complement-Schema (free constituent order))
head-complement-phrase ⇒

$$\begin{bmatrix} \text{SYNSEM}|\text{LOC}|\text{CAT}|\text{COMPS } \boxed{1} \oplus \boxed{3} \\ \text{HEAD-DTR}|\text{SYNSEM}|\text{LOC}|\text{CAT}|\text{COMPS } \boxed{1} \oplus \langle \boxed{2} \rangle \oplus \boxed{3} \\ \text{NON-HEAD-DTRS } \langle [\text{ SYNSEM } \boxed{2} \text{ }] \rangle \end{bmatrix}$$

The COMPS list of the head daughter is split into three parts: a list of arbitrary length ($\boxed{1}$), a list containing one element ($\langle \boxed{2} \rangle$) and another list of arbitrary length ($\boxed{3}$). $\boxed{1}$ and $\boxed{3}$ can be the empty list or contain one or more arguments.

For non-configurational languages it is assumed that the subject of finite verbs is treated like the other arguments, that is, it is mapped to COMPS instead of being mapped to SPR as in English (Pollard, 1996; Kiss, 1992). Having explained the difference in the HPSG analysis of configurational and non-configurational languages we can now give an example of an analysis of a language with rather free constituent order: Figures 4 and 5 show the analysis of the German sentences in (28):

(28) a. [weil] jeder das Buch kennt
because everybody the book knows
'because everybody knows the book'

b. [weil] das Buch jeder kennt
because the book everybody knows

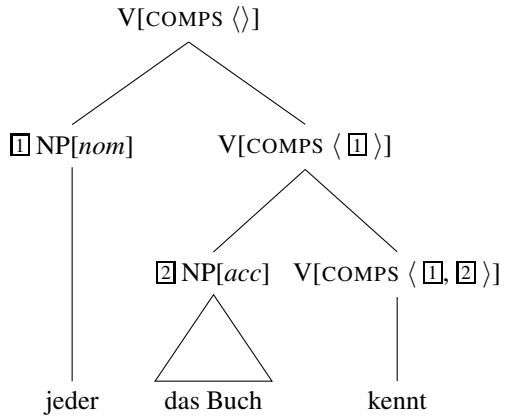

Figure 4: Analysis of *jeder das Buch kennt* (everybody the book knows)

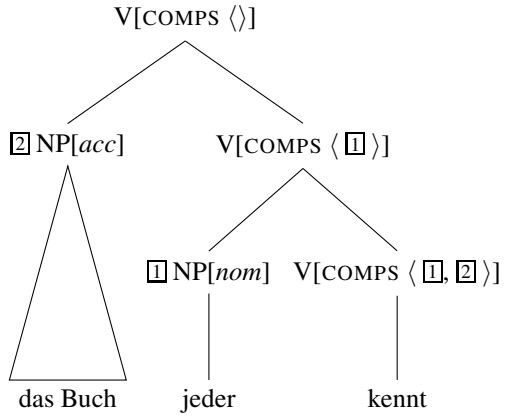

Figure 5: Analysis of *das Buch jeder kennt* (the book everybody knows)

In Figure 4 the object is combined with the verb first and the subject is represented in the COMPS list of the mother and in Figure 5 the subject is combined with the verb first and the object is represented in the COMPS list of the mother.[10]

[10] As far as constituent ordering is concerned, this analysis is equivalent to proposals that assume a set for the representation of valence information. Any element from the set can be combined with its head. Such analyses were suggested very early in the history of HPSG by Gunji (1986) for Japanese. See also Hinrichs and Nakazawa (1989), Pollard (1996), and Engelkamp, Erbach and Uszkoreit (1992) for set-based approaches to constituent order in German. A crucial difference between a set-based analysis and the list-based analysis advocated here is that the elements of the lists are ordered in order of obliqueness. This order

The difference between languages with fixed constituent order and languages with free constituent order lies in the value of $\boxed{1}$ and $\boxed{3}$ in Schema 3. If either $\boxed{1}$ or $\boxed{3}$ is the empty list one gets a fixed constituent order, with head complement combination either in order of obliqueness or in the reverse order of obliqueness. In combination with lineraization constraints one can derive VO and OV languages that way. Note also that in such a setting languages like English require more constraints ($\boxed{1} = \langle\rangle$ in Schema 3) than languages with free constituent order. While this nicely corresponds to the intuitions, it contrasts with derivational analyses that assume that all languages have Specifier Head Complement structures underlyingly and derive alternative orders by movement operations (Kayne, 1994, 2011). In such systems more has to be said about scrambling languages, while in the proposal we make here more constraints have to be stated for the more constrained languages.

2.1.2 Semantics

For the representation of semantic contributions of signs, we use Minimal Recursion Semantics (MRS, Copestake, Flickinger, Pollard and Sag, 2005) since this allows us to underspecify scope relations. (29) shows examples for the semantic contribution of a noun and a verb in Minimal Recursion Semantics (MRS):

(29) a. *dog*

$$\begin{bmatrix} \text{IND} & \boxed{1}\begin{bmatrix}\text{PER} & 3\\ \text{NUM} & sg\\ index & \end{bmatrix} \\ \text{RELS} & \left\langle \begin{bmatrix}\text{INST} & \boxed{1}\\ dog & \end{bmatrix}\right\rangle \\ mrs & \end{bmatrix}$$

b. *chases*

$$\begin{bmatrix} \text{IND} & \boxed{1}\, event \\ \text{RELS} & \left\langle \begin{bmatrix}\text{EVENT} & \boxed{1}\\ \text{AGENT} & index\\ \text{PATIENT} & index\\ chase & \end{bmatrix}\right\rangle \\ mrs & \end{bmatrix}$$

An MRS consists of an index, a list of relations, and a set of handle constraints, which will be introduced below. The index can be a referential index of a noun (29a) or an event variable (29b). In the examples above the lexical items contribute the *dog′* relation and the *chase′* relation. The relations can be modeled with feature structures by turning the semantic roles into features. The semantic index of nouns is basically a variable, but it comes with an annotation of person, number, and gender since this information is important for establishing correct pronoun bindings.

The arguments of each semantic relation (e. g. agent, patient) are linked to their syntactic realization (e. g. NP[nom], NP[acc]) in the lexicon. (30) shows an example. NP[*nom*]$_{\boxed{1}}$ stands for a description of an NP with the semantic index identified with $\boxed{1}$. The semantic indices of the arguments are structure shared with the arguments of the semantic relation *chase′*.

is used in various subparts of the theory for instance for assignment of structural case and for expressing constraints on pronoun binding. So the obliqueness ordering has to be represented elsewhere in set-based approaches.

(30) *chase*:

$$\begin{bmatrix} \text{CAT} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{VFORM} & \textit{fin} \\ & \textit{verb} \end{bmatrix} \\ \text{ARG-ST} & \langle \text{NP}[\textit{nom}]_{\boxed{1}}, \text{NP}[\textit{acc}]_{\boxed{2}} \rangle \end{bmatrix} \\ \text{CONT} & \begin{bmatrix} \text{IND} & \boxed{3}\ \textit{event} \\ \text{RELS} & \left\langle \begin{bmatrix} \text{EVENT} & \boxed{3} \\ \text{AGENT} & \boxed{1} \\ \text{PATIENT} & \boxed{2} \\ \textit{chase} & \end{bmatrix} \right\rangle \\ \textit{mrs} & \end{bmatrix} \end{bmatrix}$$

Before turning to the compositional analysis of (31a), I want to introduce some additional machinery that is needed for the underspecified representation of the two readings in (31b,c).

(31) a. Every dog chased some cat.

b. $\forall x(dog(x) \rightarrow \exists y(cat(y) \wedge chase(x,y)))$

c. $\exists y(cat(y) \wedge \forall x(dog(x) \rightarrow chase(x,y)))$

Minimal Recursion Semantics assumes that every elementary predication comes with a label. Quantifiers are represented as three place relations that relate a variable and two so-called handles. The handles point to the restriction and the body of the quantifier, that is, to two labels of other relations. (32) shows a (simplified) MRS representation for (31a).

(32) ⟨ h0, { h1: every(x, h2, h3), h2: dog(x), h4: chase(e, x, y),
h5: some(y, h6, h7), h6: cat(y) } ⟩

The tree-place representation is a syntactic convention. Formulae like those in (31) are equivalent to the results of the scope resolution process that is described below.

The MRS in (32) can best be depicted as in Figure 6. h0 stands for the top element. This is a handle that dominates all other handles in a dominance graph. The restriction of *every* points to *dog* and the restriction of *some* points to *cat*. The interesting thing is that the body of *every* and *some* is not fixed in (32). This is indicated by the dashed lines in Figure 6 in contrast to the straight lines connecting the restrictions of the quantifiers with elementary predications for *dog* and *cat*, respectively. There are two ways to plug an elementary predication into the open slots of the quantifiers:

(33) a. Solution one: h0 = h1 and h3 = h5 and h7 = h4.
(*every dog* has wide scope)

b. Solution two: h0 = h5 and h7 = h1 and h3 = h4.
(*some cat* has wide scope)

The solutions are depicted as Figure 7 and Figure 8.

There are scope interactions that are more complicated than those we have been looking at so far. In order to be able to underspecify the two readings of (34) both slots of a quantifier have to stay open.

(34) a. Every nephew of some famous politician runs.

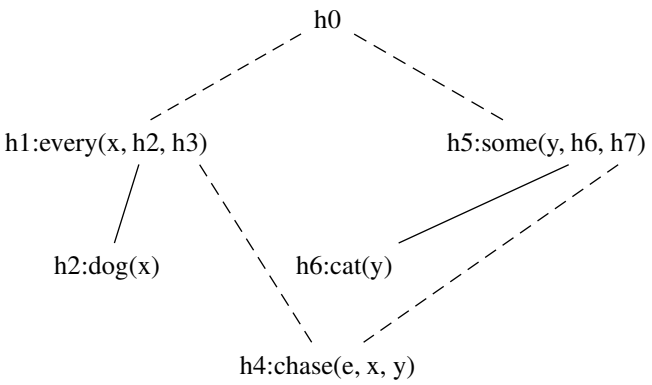

Figure 6: Dominance graph for *Every dog chases some cat.*

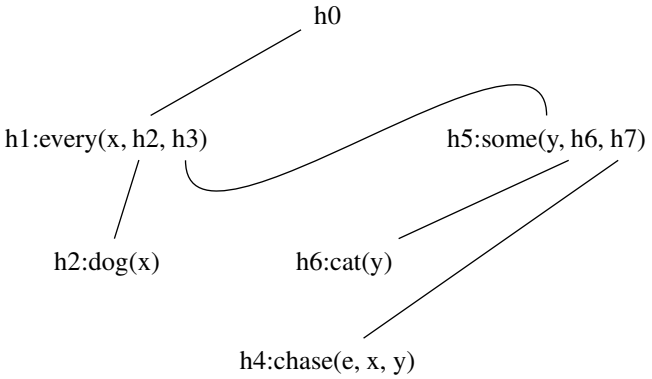

Figure 7: every(x,dog(x),some(y,cat(y),chase(x,y)))

b. every(x, some(y, famous(y) $\wedge$ politician(y), nephew(x, y)), run(x))

c. some(y, famous(y) $\wedge$ politician(y), every(x, nephew(x, y), run(x)))

In the analysis of example (31a), the handle of *dog′* was identified with the restriction of the quantifier. This would not work for (34a) since either *some′* or *nephew′* can be the restriction of *every′*. Instead of direct specification so-called handle constraints are used (*qeq* or $=_q$). A qeq constraint relates an argument handle and a label: h $=_q$ l means that the handle is filled by the label directly or one or more quantifiers are inserted between *h* and *l*. Taking this into account, we can now return to our original example. The correct MRS representation of (31a) is given in (35).

(35) $\langle$ h0, { h1:every(x, h2, h3), h4:dog(x), h5:chase(e, x, y),
h6:some(y, h7, h8), h9:cat(y) }, { h2 $=_q$ h4, h7 $=_q$ h9 } $\rangle$

The handle constraints are associated with the lexical entries for the respective quantifiers. Figure 9 shows the analysis. For compositional cases as in Figure 9, the RELS value of a sign is simply the concatenation of the RELS values of the daughters. Similarly the HCONS value is a concatenation of the HCONS values of the daughters.

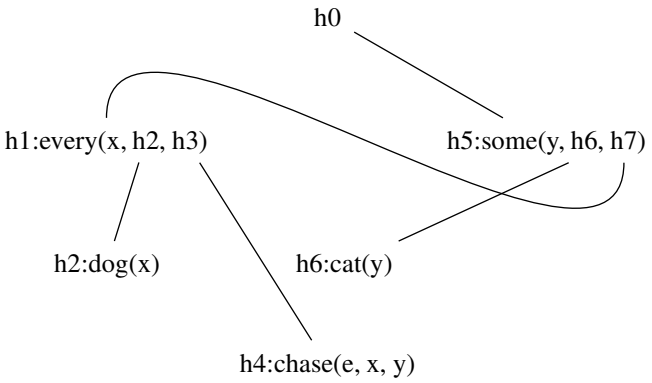

Figure 8: some(y,cat(y),every(x,dog(x),chase(x,y)))

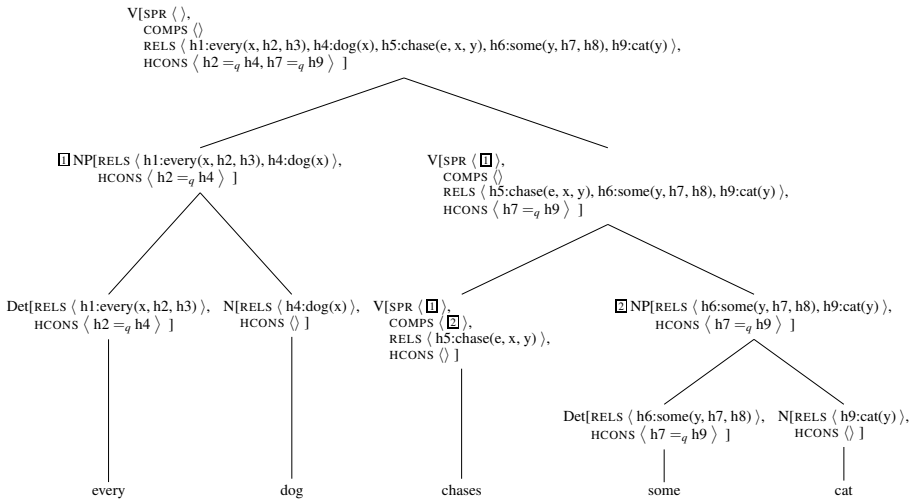

Figure 9: Analysis for *Every dog chases some cat.*

Copestake, Flickinger, Pollard and Sag, 2005 extended the basic analysis that concatenates RELS and HCONS to cases in which the meaning of an expression is more than the meaning that is contributed by the daughters in a certain structure. They use the feature C-CONT for the representation of constructional content. While usually the semantic functor (the head in head argument combinations and the adjunct in head adjunct structures) determines the main semantic contribution of a phrase, the C-CONT feature can be used to specify a new main semantic contribution. In addition relations and scope constraints may be introduced via C-CONT. The feature geometry for C-CONT is given in (36):

(36)
$$\begin{bmatrix} \text{HOOK} & \begin{bmatrix} \text{INDEX} & \textit{eventuality-or-index} \\ \text{LTOP} & \textit{handle} \end{bmatrix} \\ \text{RELS} & \textit{list of relations} \\ \text{HCONS} & \textit{list of handle constraints} \\ \textit{c-cont} & \end{bmatrix}$$

The HOOK provides the local top for the complete structure and a semantic index, that is a nominal index or an event variable (*eventuality* is the supertype of events and states, for discussion see Ramchand, 2005 and Maienborn, 2011, Section 5). In compositional structures the HOOK value is structure shared with the semantic contribution of the semantic functor and the RELS list and the HCONS list is the empty list. As an example for a non-compositional combination Copestake et al., 2005 discuss determinerless plural NPs in English. For the analysis of *tired squirrels* they assume an analysis using a unary branching schema. Their analysis corresponds to the one given in (37):[11]

(37)
$$\begin{bmatrix} \text{SYNSEM|LOC|CONT} & \boxed{1} \\ \text{RELS} & \boxed{2} \oplus \boxed{3} \\ \text{HCONS} & \boxed{4} \oplus \boxed{5} \\ \text{C-CONT} & \begin{bmatrix} \text{HOOK} & \boxed{1} \begin{bmatrix} \text{IND} & \boxed{0} \end{bmatrix} \\ \text{RELS} & \boxed{2} \left\langle \begin{bmatrix} \text{ARG0} & \boxed{0} \\ \text{RESTR} & \boxed{6} \\ \text{BODY} & \textit{handle} \\ \textit{udef-rel} & \end{bmatrix} \right\rangle \\ \text{HCONS} & \boxed{4} \left\langle \begin{bmatrix} \text{HARG} & \boxed{6} \\ \text{LARG} & \boxed{7} \\ \textit{qeq} & \end{bmatrix} \right\rangle \end{bmatrix} \\ \text{HEAD-DTR} & \begin{bmatrix} \text{SYNSEM|LOC|CONT} & \begin{bmatrix} \text{IND} & \boxed{0} \\ \text{LTOP} & \boxed{7} \end{bmatrix} \\ \text{RELS} & \boxed{3} \left\langle \begin{bmatrix} \text{LBL} & \boxed{7} \\ \text{ARG1} & \boxed{0} \\ \textit{tired} & \end{bmatrix}, \begin{bmatrix} \text{LBL} & \boxed{7} \\ \text{ARG0} & \boxed{0} \\ \textit{squirrel} & \end{bmatrix} \right\rangle \\ \text{HCONS} & \boxed{5} \langle\rangle \end{bmatrix} \end{bmatrix}$$

[11] We do not assume a unary branching schema for bare plurals but an empty determiner, since using an empty determiner captures the generalizations more directly: while the empty determiner is fully parallel to the overt ones, the unary branching schema is not parallel to the binary branching structures containing an overt determiner. See also Alqurashi and Borsley, 2012 for a similar point regarding relative clauses in Modern Standard Arabic with and without a complementizer.

The semantic content of the determiner is introduced constructionally in C-CONT. It constist of the relation *udef-rel′*, which is a placeholder for the quantifier that corresponds to *some* or *every* in the case of overt determiners. The RELS and HCONS values that are introduced constructionally ($\boxed{2}$ and $\boxed{4}$) are concatenated with the RELS and HCONS values of the daughters ($\boxed{3}$ and $\boxed{5}$).

The Semantics Principle can now be specified as follows:

Principle 1 (Semantics Principle) *The main semantic contribution of a phrase is identical to the value of* C-CONT|HOOK. *The* RELS *value is the concatenation of the* RELS *value in* C-CONT *and the concatenation of the* RELS *values of the daughters. The* HCONS *value is the concatenation of the* HCONS *value in* C-CONT *and the concatenation of the* HCONS *values of the daughters.*

Having introduced our background assumptions, we can now turn to the analysis of copula constructions.

2.2 The Copula as Raising Verb

We start the part that deals with copula constructions by explaining the lexical entry of the copula that is traditionally assumed. (38) shows the lexical entry for the copula that is analoguous to the ones assumed by Pollard and Sag (1994, 147) and Bender (2000, 48):[12]

(38) Preliminary entry for the predicative copula for Danish and English:

$$\begin{bmatrix} \text{ARG-ST} & \boxed{1} \oplus \left\langle \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{PRD} & + \\ \text{SUBJ} & \boxed{1} \end{bmatrix} \\ \text{SPR} & \langle\rangle \\ \text{COMPS} & \langle\rangle \\ \text{CONT} & \begin{bmatrix} \text{IND} & \boxed{3} \\ \text{LTOP} & \boxed{4} \end{bmatrix} \end{bmatrix} \right\rangle \\ \text{CONT} & \begin{bmatrix} \text{IND} & \boxed{3} \\ \text{LTOP} & \boxed{4} \end{bmatrix} \\ \text{RELS} & \langle\rangle \\ \text{HCONS} & \langle\rangle \end{bmatrix}$$

The copula selects a predicative phrase (PRD +) and takes over the referential index ($\boxed{3}$) and the LTOP value ($\boxed{4}$) from the embedded predicative phrase. The copula does not contribute semantically, hence the RELS list is empty.

We follow Maienborn (2005, 301) in assuming that copula constructions involve a variable that can be modified by temporal adjuncts. This element is of type *state*. (39a) shows one of the examples that Maienborn used to argue for such an referential argument. However, modifications by adjuncts like *seit dem Morgen* are also possible in attributive constructions, in which the copula is not present, as is demonstrated by (39b) (see also Engelberg, 2005, 344):

[12] We omitted the SYNSEM and CAT features in order to keep things readable. See page 35 for the final version of the copula with full feature specification.

(39) a. Carol war seit dem Morgen wütend.
Carol was since the morning angry
'Carol was angry since the morning.'

b. der seit dem Morgen wütende Mann
the since the morning angry man
'the man who is angry since the morning'

We therefore do not assume that a state variable is introduced by the copula but rather by the predicate that is embedded under the copula. The respective value of the predicate is taken over by the copula, which is enforced by the structure sharing $\boxed{3}$ in (38).

Returning to the lexical entry in (38), the copula enters inflectional lexical rules and these rules introduce relations that provide information about tense. The IND value of the copula functions as the argument of a tense relation. The argument of the respective relation is required to be of type *eventuality*, that is, it is a subtype of *eventuality*.[13] Therefore, the INDEX value of the copula in (38) is specified by the inflectional rule to be of type *eventuality* and hence the INDEX value of the embedded predicate has to be compatible with the type *eventuality* as well. This excludes phrases with referential indices as for instance referential NPs in this position.

The SUBJ value of the predicative phrase ($\boxed{1}$) is raised to the ARG-ST of the copula. We assume that SUBJ is not a valence feature (Pollard, 1996; Kiss, 1992). In configurational languages like Danish and English the subject of verbs is mapped to SPR. For non-configurational languages the subject of finite verbs is mapped to the COMPS list and the one of non-finite verbs is mapped to SUBJ, since it is never combined with the verb directly. The subject of the predicative APs, NPs, and PPs is represented under SUBJ.

The actual length of the SUBJ list is not specified in (39), so in principle the value of SUBJ could be the empty list. However, in Danish and English all predicates have to have a subject, so it follows from the specification of other lexical items that the SUBJ list always contains at least one element. For a one-element SUBJ list we get the following mapping from ARG-ST to SPR and COMPS:

(40) The mapping to SPR and COMPS of a predicative copula with a subject:

$$\begin{bmatrix} \text{SPR} & \boxed{1} \\ \text{COMPS} & \boxed{2} \\ \text{ARG-ST} & \boxed{1} \oplus \boxed{2} \left\langle \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{PRD} & + \\ \text{SUBJ} & \boxed{1} \end{bmatrix} \\ \text{SPR} & \langle\rangle \\ \text{COMPS} & \langle\rangle \end{bmatrix} \right\rangle \end{bmatrix}$$

The predicative argument is mapped to COMPS and its subject to SPR.

(41) shows the lexical item for the predicative adjective *klog* ('smart'):

[13] *eventuality* is to be understood as the most general type referring to situations. *state* is a subtype of *eventuality*. The only thing that is important here is that the type *eventuality* differs from the type used to refer to objects (*index*).

(41)
$$\begin{bmatrix} \text{SYNSEM|LOC} & \begin{bmatrix} \text{CAT} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{SUBJ} & \langle \text{NP}_{\boxed{1}} \rangle \\ \textit{adj} & \end{bmatrix} \\ \text{SPR} & \langle\rangle \\ \text{COMPS} & \langle\rangle \end{bmatrix} \\ \text{CONT} & \begin{bmatrix} \text{IND} & \boxed{2}\ \textit{state} \\ \text{LTOP} & \boxed{3} \end{bmatrix} \end{bmatrix} \\ \text{RELS} & \left\langle \begin{bmatrix} \text{LBL} & \boxed{3} \\ \text{ARG0} & \boxed{2} \\ \text{ARG2} & \boxed{1} \\ \textit{smart} & \end{bmatrix} \right\rangle \\ \text{HCONS} & \langle\rangle \end{bmatrix}$$

The subject of the adjective is represented under SUBJ and the referential index of the subject ($\boxed{1}$) is linked to the theme role of the adjective (ARG2).

With these lexical items for the copula and the adjective we can now explain Figure 10 on the following page, which shows the analysis of (42).

(42) Han er klog.
he is smart

The subject of the adjective is NP_x. It is linked to smart(k,x) in the lexical item for *klog*. The linking is expressed by the structure sharing $\boxed{1}$ in (41) and *k* stands for the state. The copula selects for the adjective ($\boxed{2}$) and takes its subject over to its SPR list. The copula is inflected, which adds the *present′* relation to the RELS list. After combination with the adjective, the copula is combined with the subject ($\boxed{1}$ in Figure 10) by the Specifier-Head Schema.

2.3 Predicative NPs

We assume that predicative NPs have the same internal syntactic and semantic structure as non-predicative NPs. They only differ with respect to their external distribution, that is, the way they can be used in sentences. We assume the unary branching Schema 4 on page 24, which licences a predicative NP from a non-predicative one.[14] This unary projection applies to a full NP and licenses the predicative NP (PRD+) with an appropriate SUBJ value. The variable of the licenced predicative NP is the value under SYNSEM|CONT|IND. This value is coindexed with the eventuality variable of the *eqaual-rel′* relation and is of type *state*. The referential index of the subject NP ($\boxed{1}$) and the referential index of the daughter NP ($\boxed{2}$) are arguments of the relation *equal-rel′*. This relation is introduced constructionally via C-CONT (see page 19 on semantic composition and C-CONT). The unary branching rule cannot apply to its output since the daughter NP has to have an IND value of type *index* and the resulting sign has an IND value of type *state*.

Note that this schema avoids the coindexing of the referential index of the embedded noun phrase with the index of the subject. This is important since the index

[14] Gerbl (2007, 241–242) independently suggested a similar solution. See also Partee, 1987.

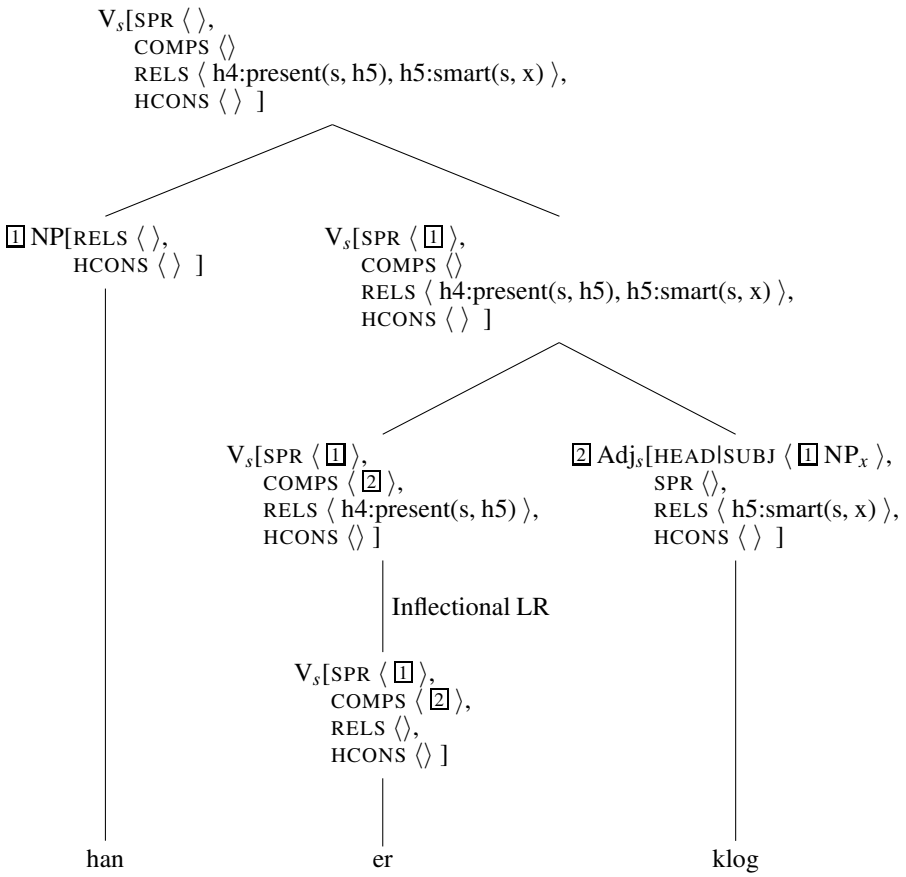

Figure 10: Analysis of *Han er klog.* ‘He is smart.’

Schema 4 (Predicative NP Projection Schema)

np-pred-phrase ⇒

$$\begin{bmatrix}
\text{SYNSEM|LOC} & \begin{bmatrix}
\text{CAT} & \begin{bmatrix}
\text{HEAD} & \begin{bmatrix}\text{PRD} & + \\ \text{MOD} & \textit{none} \\ \text{SUBJ} & \langle \text{NP}\boxed{1} \rangle \\ \textit{noun} & \end{bmatrix} \\
\text{SPR} & \langle\rangle \\
\text{COMPS} & \langle\rangle
\end{bmatrix} \\
\text{CONT} & \begin{bmatrix}\text{IND} & \boxed{0}\end{bmatrix}
\end{bmatrix} \\
\text{C-CONT} & \begin{bmatrix}
\text{RELS} & \left\langle \begin{bmatrix}\text{ARG0} & \boxed{0}\,\textit{state} \\ \text{ARG1} & \boxed{1} \\ \text{ARG2} & \boxed{2} \\ \textit{equal-rel} & \end{bmatrix} \right\rangle \\
\text{HCONS} & \langle\rangle
\end{bmatrix} \\
\text{NON-HEAD-DTRS} & \left\langle \begin{bmatrix}
\text{SYNSEM|LOC} & \begin{bmatrix}
\text{CAT} & \begin{bmatrix}
\text{HEAD} & \begin{bmatrix}\text{MOD} & \textit{none} \\ \textit{noun} & \end{bmatrix} \\
\text{SPR} & \langle\rangle \\
\text{COMPS} & \langle\rangle
\end{bmatrix} \\
\text{CONT} & \begin{bmatrix}\text{IND} & \boxed{2}\,\textit{index} \\ \textit{npro} & \end{bmatrix}
\end{bmatrix}
\end{bmatrix} \right\rangle
\end{bmatrix}$$

values contain information about person, number, and gender, since these features play a role in Binding Theory (Pollard and Sag, 1992). As was pointed out by Duden (1966, § 6920), Jung (1967, 138), Reis (1982, 197), and Müller (1999, 273) the subject does not necessarily agree with the predicative noun in gender and number.

(43) a. Das Kind ist ein Dieb.[15]
the child.N is a thief.M

b. Ich finde das eine gute Sache.[16]
I find this.N a good thing.F
'I think this is a good thing.'

This leads to incompatible indices (Müller, 1999, 273; Van Eynde, 2012) and hence, the analysis proposed here does not enforce any coindexing constraints on predicative noun phrases and their subjects. This probably admits ungrammatical structures, but on the other hand it does not rule out grammatical structures like (43) as an analysis with identification of the indices does. We leave the work on additional constraints for agreement to further research.

Having introduced the Predicative NP Projection Scheme, we now can analyze (44) as is shown in Figure 11 on page 26.

[15] Duden (1966, 624).

[16] http://www.tegernseerstimme.de/der-ubermasigen-bauwut-einhalt-gebieten/60271.html. 14.11.2012.

(44) Han er en klog mand.
he is a smart man

The NP *en klog mand* is analyzed as is standard for NPs (in HPSG, Pollard and Sag, 1994, Section 9.4.3): Adjective and noun form an $\overline{\text{N}}$, which is then combined with the determiner into an NP. The referential index of the noun *mand* is y. This index is projected along the head path to the full NP. Schema 4 projects the referential NP_y into a predicative phrase. The predicative phrase has a singleton list containing an NP as the value of the head feature SUBJ. The referential index of the NP in the SUBJ list is one argument of the relation *equal_rel′* and the other argument is the referential index of the NP *en klog mand*, that is y. The index of the predicative NP is the state variable that belongs to the relation *equal_rel′*. As was specified in (38), the index of the embedded predicate is identified with the index of the copula. The item in (38) is the specification of a root. Roots have to be inflected before beeing usable in syntax. Inflectional lexical rules that apply to verbs add tense information. In the case of *er* ('is') a relation for present tense is added. The copula has the SUBJ list of the embedded predicate as a prefix of its ARG-ST list. As was shown in (40), this prefix is mapped to SPR. In Figure 11 the SUBJ list of the embedded predicate and hence the SPR list of the copula contains the NP_x. After the combination of copula and predicative phrase the resulting VP is combined with the missing specifier. The RELS and HCONS values are always the concatenation of the respective values of the daughters, with the exception of the projection from NP_y to NP_{k1}, where h5:equal_rel(k1, x, y) is contributed by the C-CONT of Schema 4.

The schema as given above would overgenerate since it also applies to proper names. Rieppel (2012) argued that such overgeneration cannot be ruled out by requiring that the schema applies to NPs with definite determiners only since there are German dialects in which proper names are used with a determiner. Furthermore he pointed out interesting cases in English that involve proper names in complex NPs. (45) provides an example of such an identificational definite:

(45) the city of Oakland

As Rieppel showed such NPs cannot be used predicatively:

(46) a. ? I considered [that the City of Oakland]
b. * It is lively, energetic, and the City of Oakland.

(46b) would be expected to be grammatical if *the City of Oakland* could be a predicate like *lively* and *energetic*. However, the application of Schmea 4 to proper names and NPs like (45) can be excluded by requiring that the main relation of the NP daughter is not *named_rel′*. We follow Pollard and Sag (1994, 340) in assuming that proper names introduce such a relation. The framework of Minimal Recursion Semantics as described in Copestake et al., 2005 makes use of a feature KEY that points to the main semantic contribution of a phrase. As was argued by Rieppel, the noun *city* does not contribute the main semantic relation of the expression *the City of Oakland*. We therefore assume that the main contribution is the relation *named_rel′*, which has *Oakland* as one of its arguments. Therefore it is possible to rule out the application

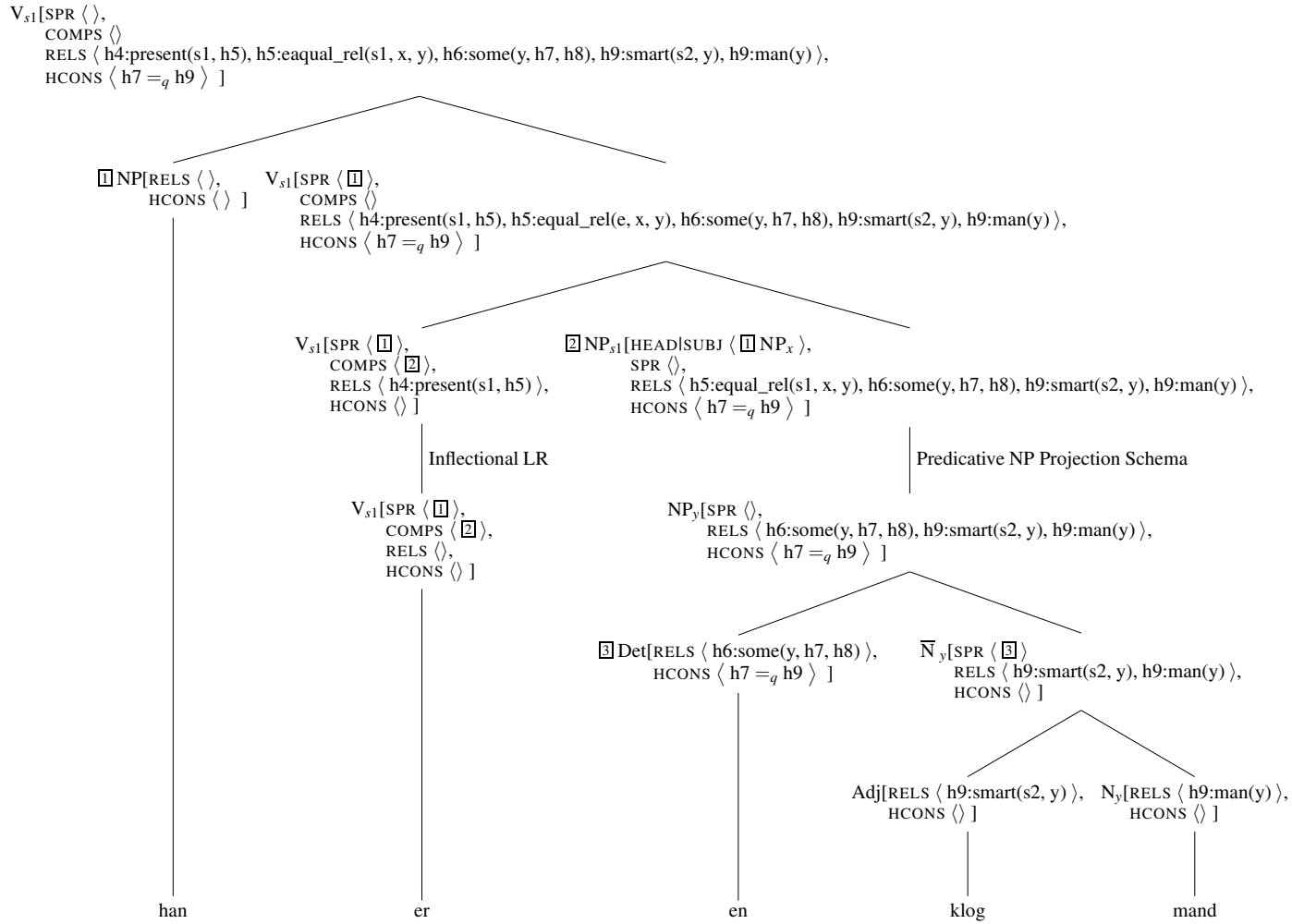

Figure 11: Analysis of *Han er en klog mand.* 'He is a smart man.'

of Schema 4 to (45) by requiring that the KEY value of the daughter must be different from *named_rel′*.

Note that this analysis allows us to keep most parts of the analysis constant for examples that involve a predicative NP rather than a predicative adjective.

The analysis with the special predication schema changes the semantic type of an NP and its syntactic properties. It is interesting to note that a similar analysis is necessary for temporal NPs: As Flickinger (2008, 91–92) points out, it is not just simple NPs that can act as modifiers of verbs. The time nouns can be embedded inside of a more complex NP, as (47) shows.

(47) a. Kim disappears those days.
b. Kim disappears some of those days.

Therefore a treatment in which the time noun is lexically specified as a modifier is not appropriate. One could claim that 'some of' just takes over the modifier function from the embedded NP, but this would not extend to the following German examples:

(48) a. Er arbeitete den größten Teil der Nacht.
he worked the.ACC largest part of.the.GEN night
'He worked almost all night.'
b. Er arbeitete die halbe Nacht.
he worked the.ACC half.ACC night
'He worked half of the night.'
c. * Er arbeitete der halben Nacht.
he worked the.DAT half.DAT night

In (48a) the time expression *der Nacht* is genitive but the whole NP is accusative. This accusative is called a semantic case. It is connected to the function of the NP and is not assigned by the verb. It is clear from data like (48a) that an analysis like the one suggested by Müller (2007b, 226) that assigns both function (i. e. the MOD value, which contains a description of a linguistic object that can be modified by a certain linguistic sign) and case lexically cannot explain the data in (48a). Hence we have evidence from another area of grammar that type shifting phrasal schemata are needed.

In addition to the unary branching Schema 4 one needs a similar schema or lexical rule for sentences with determinerless predication like (2f), repeated here as (49).

(49) Sylvia is mayor of Seattle.

The noun *mayor* is mapped to a predicative version. This predicative version can be combined with its arguments but since the index is of the wrong type it cannot be combined with adjuncts. Hence, it is explained why (50) is excluded:

(50) * Sylvia is new mayor of Seattle.

If one wants to admit the *elected major* examples from Footnote 1, one could assume a version of our predication schema that maps an $\overline{\text{N}}$ onto a predicative NP rather than mapping a referential N to a predicative one. This schema would introduce the semantic content of the missing determiner and appart from this be parallel to Schema 4.

2.4 Generalizing the Copula for German

The previous sections showed how predicational copula constructions can be analyzed in Danish and this analysis is equally applicable to English. However, German allows for the formation of predicate complexes and in order to capture this, the lexical entry for the copula has to be generalized. As was argued in Section 1.6, German adjective copula combinations should be analyzed as complex predicates, that is, the copula and the adjective form a unit and the arguments of the adjective are combined with the resulting complex in later steps. Parallel analyses have been suggested for the verbal complex in German by Hinrichs and Nakazawa (1989, 1994), Kiss (1995), Müller (1996, 1999, 2002), and Meurers (1999, 2000). The respective authors use the technique of argument composition or argument attraction that was first developed by Geach (1970) in the framework of Categorial Grammar.

The generalized version of the lexical item for the copula in (38) is given in (51):

(51) Generalized entry for the predicative copula for German, Danish, and English:

$$\begin{bmatrix} \text{ARG-ST} & \boxed{1} \oplus \boxed{2} \oplus \left\langle \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{PRD} & + \\ \text{SUBJ} & \boxed{1} \end{bmatrix} \\ \text{COMPS} & \boxed{2} \\ \text{CONT} & \begin{bmatrix} \text{IND} & \boxed{3} \\ \text{LTOP} & \boxed{4} \end{bmatrix} \end{bmatrix} \right\rangle \\ \text{CONT} & \begin{bmatrix} \text{IND} & \boxed{3} \\ \text{LTOP} & \boxed{4} \end{bmatrix} \\ \text{RELS} & \langle\rangle \\ \text{HCONS} & \langle\rangle \end{bmatrix}$$

The difference between (51) and the earlier entry is that the COMPS list of the embedded predicate is raised to the ARG-ST of the copula. This is similar to what Müller (2002, 103) suggested. For a discussion of Müller's proposal see Section 3.3.

Note that nothing is said about the actual members of the lists. It is therefore possible to handle the cases in (52) as well as the subjectless examples that were given in (19).

(52) a. weil er auf seinen Sohn stolz ist
because he.NOM on his son proud is
'because he is proud of his son'

b. weil er klug ist
because he.NOM smart is
'because he is smart'

In the analysis of (52a), $\boxed{1}$ contains the subject (*er* ('he')) and $\boxed{2}$ the PP (*auf seinen Sohn* 'of his son'). In the analysis of (52b), $\boxed{1}$ contains the subject (*er*) and $\boxed{2}$ is the empty list. In the analysis of (19b) – repeated here as (53a) –, $\boxed{1}$ is the empty list and $\boxed{2}$ contains the dative object *ihm* ('him').

(53) a. weil ihm schlecht ist
weil him.DAT bad is
'because he is sick'

b. weil schulfrei ist
because school.free is
'because there is no school'

In the analysis of (19a) – repeated here as (53b) –, both $\boxed{1}$ and $\boxed{2}$ are the empty list. It is important to note that the lexical item of the copula does not contain any statements regarding the syntactic or semantic arity of the embedded predicate. Approaches that treat the semantics of the copula parallel to an intransitive verb (Engelberg, 2005, 345) or a transitive verb (Montague, 1974, 261; Van Eynde, 2008, 264–265) cannot explain sentences like (53b). See Section 3.2 for further discussion.

As was discussed in Section 2.1.1, we assume that all arguments of finite verbs are mapped to the COMPS list in German. The analysis of (52a) is depicted in Figure 12. The adjective and the copula are combined with the Schema 5:

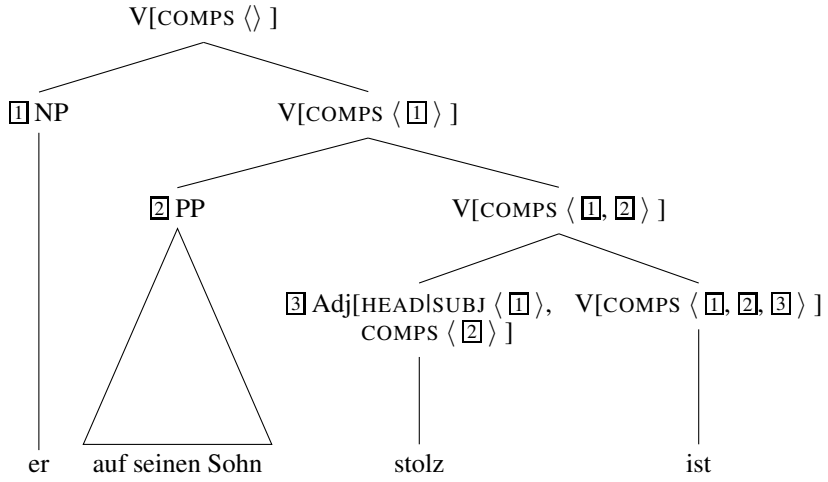

Figure 12: Analysis of *er stolz auf seinen Sohn ist* 'He is proud of his son.'

Schema 5 (Predicate Complex Schema)
head-cluster-phrase ⇒

$$\begin{bmatrix} \text{SYNSEM} & \begin{bmatrix} \text{LOC}|\text{CAT}|\text{COMPS } \boxed{1} \end{bmatrix} \\ \text{HEAD-DTR} & \begin{bmatrix} \text{SYNSEM}|\text{LOC}|\text{CAT}|\text{COMPS } \boxed{1} \oplus \langle \boxed{2} \rangle \end{bmatrix} \\ \text{NON-HEAD-DTRS} & \langle [\text{ SYNSEM } \boxed{2} [\text{ LEX } +]] \rangle \end{bmatrix}$$

This schema differs from the Head-Complement Schema in allowing unsaturated signs that are compatible with the LEX+ requirement to be combined with their selecting head. Schemata like the Specifier-Head Schema, the Head-Complement Schema, the Head-Adjunct Schema, and the Head-Filler Schema licence signs that have the LEX

value '−' and hence would not qualify as daughters in the predicate complex.[17]

Since the adjective *stolz* ('proud') selects for a PP via COMPS and has an NP on its SUBJ list, the ARG-ST of the copula is instantiated to a list that contains the subject NP of *stolz*, the PP object of *stolz* and a description of the adjective *stolz* itself. All arguments are mapped to the COMPS list of the copula (see Section 2.1.1). Copula and adjective are combined via the Predicate Complex Schema and the resulting complex is combined with the remaining arguments via the Head-Complement Schema. Since German is a language with rather free constituent order, the Head-Complement Schema allows the combination of the head with any of its arguments and hence orders in which the PP is placed before the subject as in (54) are accounted for:

(54) weil auf solche Kinder niemand stolz ist
because on such children nobody proud is
'because nobody is proud of such children'

The lexical item in (51) can also be used for Danish and English since it is assumed that head-complement phrases require their non-head daughter to be saturated. It follows from this assumption that the COMPS list of the predicative argument (2 in (51)) has to be the empty list if this argument is the non-head daughter in a head-complement phrase. Hence, nothing but the subject is raised from the predicative element. German and Dutch differ from English and Danish in allowing complex formation. When predicate complexes are formed, 2 in (51) can be non-empty, since the predicate complex schema does not impose any restrictions on the length of the COMPS list of its non-head daughter.

2.5 Raising and Complex Formation

There is another important aspect regarding the lexical item in (51) and the Predicate Complex Schema: The predicate is selected via COMPS rather than VCOMP or XCOMP as it was suggested in earlier proposals by Chung (1993), Rentier (1994), Müller (1997), and Kathol (1998) (see Section 3.3). With a uniform selection of verbal complements via COMPS it is possible to treat optionally coherent verbs like *versuchen* ('to try') with one lexical item (Kiss, 1995, 178), rather than with two lexical items as in the analyses of Kathol (2000, 195) and Müller (1999, 340–341; 2002, 100–101). The matrix verb does not specify whether it forms a verbal complex with the embedded verb or not. It does not mention the LEX value of the embedded verbal element. Because of this we can analyze examples with a predicate complex as in (55a) and examples like (55b) with so-called intraposition:

(55) a. Karl hat das Buch nicht [zu lesen versucht]. (Predicate Complex S.)
Karl has the book not to read tried
'Karl did not try to read the book.'

b. Karl hat [das Buch zu lesen] nicht versucht. (Head-Complement S.)
Karl has the book to read not tried
'Karl did not try to read the book.'

[17] This is a simplification. Some phrasal signs actually are allowed in the verbal complex. See Müller, 1999, Chapter 14.3, Chapter 17.5 for an analysis of the so-called Third Construction and Verb Projection Raising.

The combination of *zu lesen* and *versucht* in (55a) is licensed by the Predicate Complex Schema and the combination of *das Buch zu lesen* with *versucht* in (55b) is licensed by the Head-Complement Schema.

In contrast to the optionally coherent verb *versuchen* ('to try'), verbs like *scheinen* ('to seem') or modals, which obligatorily construct coherently, select a verbal complement that is LEX+. Consequently they do not allow for intraposition of a VP complement, but require complex formation.

Müller (2002, 112) criticized Kiss's analysis of optional coherence because it also licences unwanted structures like (56) and hence results in spurious ambiguities.

(56) weil Karl das Buch [[dem Mann zu geben] verspricht]
because Karl the book the man to give promises
'because Karl promises to give the book to the man'

In (56) *versprechen* is combined with a partly saturated verbal projection *dem Mann zu geben* and the non-saturated argument *das Buch* is raised and combined with *dem Mann zu geben verspricht* in a later step. However, this structure is excluded if arguments are required to be saturated and elements of the predicate complex are required to be LEX +.[18]

With the new treatment of predicate selection via COMPS, it is not required that predicative PPs are part of the predicate complex as was suggested by Müller (2002, 241) for PPs in resultative constructions. Instead PPs like NPs can be analyzed as complements in head-complement structures, while adjectives can take part in complex formation or adjective phrases can be part of head-complement structures. The crucial difference between nouns and prepositions on the one hand and adjectives on the other hand is the direction of government: verbs and adjectives govern their arguments to the left, while nouns and prepositions take their arguments to the right. Only those dependents that govern their arguments to the same side as their governing heads can form a complex with their head.

Returning to the copula, it allows the embedding of fully saturated phrases like predicative APs, NPs, and PPs but also allows for the formation of a predicate complex consisting of adjective and copula. Since coherence is optional we can explain so-called focus movement of adjectives as in (23) – repeated here as (57) –, something that was noted by Müller (2002, 69) but not treated in his analysis.

(57) a. Sie wuchsen in einem gesellschaftlichen Klima auf, das *freier* in
they grew in a social climate PART(up) that freer in
Deutschland nie *war*.[19]
Germany never was
'They grew up in a social climate that was freer than ever in Germany.'

b. daß *ausschlaggebend für die Interpretation abgeleiteter Verben*
that decisive for the interpretation derived verbs

[18]This is a simplification as was already noted in footnote 17.
[19]taz, 01.07.1995, 10.

bestimmte semantische Interpretationsmuster *sind*, [...][20]
certain semantic interpretation.models are
'that certain semantic interpretation models [...] are decisive for the interpretation of derived verbs'

2.6 German, English, Danish: Specificational Constructions, Question Tags, and Left Dislocation

The difference between specificational and predicational structures is best captured by generalizing the German lexical item for the copula even further: Instead of using the append operator ($\oplus$) to concatenate two lists as in (51), the more general version of the copula uses the shuffle operator ($\bigcirc$):

(58) ARG-ST value for the predicational and specificational copula:

$$\begin{bmatrix} \text{ARG-ST} & (\boxed{1} \oplus \boxed{2}) \bigcirc \left\langle \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{PRD} & + \\ \text{SUBJ} & \boxed{1} \end{bmatrix} \\ \text{COMPS} & \boxed{2} \end{bmatrix} \right\rangle \end{bmatrix}$$

The shuffle operator was introduced by Reape (1994, 152–153) to combine two lists. The resulting list has to contain all elements of the two lists that are combined and the relative order of the respective lists has to be maintained. If we shuffle the two lists $\langle$ 1, 2, 3 $\rangle$ and $\langle$ 4, 5 $\rangle$, for instance, we get all lists in which 1 is before 2 and 2 is before 3 and 4 is before 5. But 4 and 5 may appear before or between the elements in the first list. $\langle$ 4, 1, 5, 2, 3 $\rangle$ is part of the result of the shuffle operation. For the lexical item above this means that the predicative argument can be positioned in the ARG-ST list before, between or after the elements of its SUBJ and COMPS list.

Since English and Danish do not form predicate complexes there is just the Specifier-Head Schema and the Head-Complement Schema, which require arguments to be fully saturated. Hence $\boxed{2}$ is instantiated as the empty list when the copula is part of larger structures. $\boxed{1}$ is a list containing exactly one element, since neither English nor Danish allows for subjectless constructions. So for English and Danish we have a trivial case of the application of shuffle: Two lists with exactly one element are shuffled. The result is that the predicative argument is ordered first or last. When it is ordered last we get a lexical item as in (38) with a mapping to SPR and COMPS as in (40). The respective analysis was already explained in Section 2.2. If the predicative argument is shuffeled to the initial position on the ARG-ST list it will be mapped to SPR and the subject of the predicate will be mapped to COMPS as in (59).[21]

[20] In the main text of Kaufmann, 1995, *Konzeptuelle Grundlagen semantischer Dekompositionsstrukturen*, 162.

[21] An alternative would be to keep a strictly ordered ARG-ST list and allow for a non-canonical mapping of the elements to SPR and COMPS. So instead of mapping the first element to SPR and the second to COMPS, the second element would be mapped to SPR and the first one to COMPS. Such non-canonical mappings would be restricted to the copula lexemes.

(59) The copula with the specificational mapping to SPR and COMPS:

$$\begin{bmatrix} \text{SPR} & \boxed{2} \\ \text{COMPS} & \boxed{1} \\ \text{ARG-ST} & \boxed{2}\left\langle \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{PRD} & + \\ \text{SUBJ} & \boxed{1} \end{bmatrix} \\ \text{COMPS} & \langle\rangle \\ \text{CONT} & \begin{bmatrix} \text{IND} & \boxed{3} \\ \text{LTOP} & \boxed{4} \end{bmatrix} \end{bmatrix} \right\rangle \oplus \boxed{1} \\ \text{CONT} & \begin{bmatrix} \text{IND} & \boxed{3} \\ \text{LTOP} & \boxed{4} \end{bmatrix} \\ \text{RELS} & \langle\rangle \\ \text{HCONS} & \langle\rangle \end{bmatrix}$$

The analysis of (60) is given in Figure 13.

(60) at vinderen er han
that winner is he
'that the winner is he'

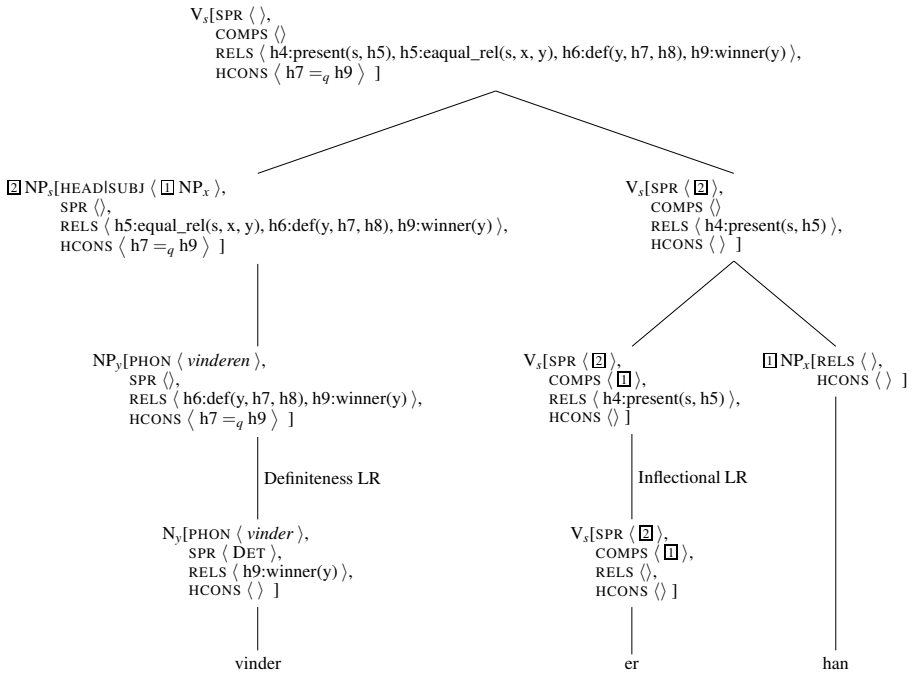

Figure 13: Analysis of *vinderen er han* 'The winner is he' in an embedded clause

The analysis is similar to the one in Figure 11, the only difference is that the predicative noun phrase is realized preverbally and the pronoun postverbally. At first glance it

might seem strange that the VP contains a tense predication without containing the relation that is specified by the tense relation namely *equal_rel′*. But note that this relation is accessible in the lexical item of the copula, since the copula selects the predicative phrase (2 in Figure 13). As was shown in (59), the LTOP of the copula is identified with the LTOP of the embedded predicate (h5 in Figure 13). This handle is then the argument of the tense relation.

2.7 Constraints on Extraction

Gerbl (2007, 102, 190–191) pointed out that there are additional constraints regarding extraction of or extraction out of the post-copular phrase in specificational structures. These can be formalized by the following implicational constraint with a complex antecedent:

(61) $$\left[\text{ARG-ST}\ \langle\ [\ \text{PRD}\ +\ ]\ \rangle \oplus \square\right] \Rightarrow \left[\text{ARG-ST}\ \langle\ [\ ],\ [\ \text{NONLOC}|\text{INHER}|\text{SLASH}\ \langle\rangle]\ \rangle\right]$$

This constraint says that all items that have a predicative argument as the first member of their ARG-ST list require their second member of the ARG-ST list (the subject that is predicated over) to have an empty SLASH list. In HPSG extraction is modelled as the passing up of information about missing elements (Gazdar et al. 1985, Pollard and Sag 1994, Chapter 4). This information is represented as the value of SLASH. So a constituent that has a gap inside or that is a gap has a non-empty list as SLASH value. If an element is extracted, its SLASH value is a list with one element that is identical to the local value of the extracted element. If something is extracted from inside an argument, SLASH also contains at least one element. Hence, requiring that the SLASH value is the empty list blocks extraction of the second ARG-ST element and extraction out of this element.

The constraint in (61) ensures that the example in (13d) – repeated here as (62a) is excluded. In addition it avoids spurious ambiguities for sentences like (62b).

(62) a. * Max$_i$ tror han, at vinderen er $\__i$.
Max thinks he that winner.DEF is
'He thinks that the winner is Max.'

b. Max er vinderen.
Max is winner.DEF
'Max is the winner.'

Without the restriction in (61) the sentence in (62b) could have the structure in (63):[22]

(63) Max$_i$ [er$_j$ [$_S$ vinderen [$_{VP}$ $\__j$ $\__i$]]].

[22] We follow Müller and Ørsnes (In Preparation) in assuming a head-movement analysis of Danish as is standard for German (Kiss, 1995; Meurers, 2000; Müller, 2005). But nothing hinges on that. The important point is that Danish is a V2 language and subjects, objects, and predicates can be fronted.

Max would be the extracted complement of the (moved) copula ($\__j$) and *vinderen* would be the specifier. Since the extraction of the underlying subject is prohibited by (61), (63) is ruled out and the only legitimite structure for (62b) is the one in (64):

(64) Max_i [er_j [$_{\text{S}}$ $\__i$ [$_{\text{VP}}$ $\__j$ vinderen]]].

Note that these restrictions cannot easily be captured by a surface-oriented linearization constraint that requires the element that is predicated over has to stay after the copula, since this constraint is not violated in (65):

(65) Er Max vinderen?

Rather one would need a set of constraints that requires the predicate to be serialized before its subject, but only if the structure is specificational. The constraint has to be blocked from being applied to the normal predicational structures since otherwise normal predicational structures are ruled out. This means that one would mark the predicate according to the specificational/predicational status of the construction it appears in or alternatively make the linearization constraint dependent on other linguistic objects like the copula or the phrasal configuration as a whole. Since phrasal approaches that would treat specificational structures as a fixed construction are problematic (Müller, 2006; Müller and Wechsler, 2013), the only option seems to be to assume complex linearization constraints that refer to three items. This is a highly undesirable situation that is avoided in models that analyze the fronting of a constituent as extraction.

Before we turn to the next topic, we want to give the final, fully specified lexical item that subsumes the copula in Danish, English, German, and probably a lot of other languages:

(66) Constraint on the entry for the Danish, English, and German copula (final version):

$$\begin{bmatrix} \text{SS|LOC} & \begin{bmatrix} \text{CAT} & \begin{bmatrix} \text{HEAD} & \textit{verb} \\ \text{ARG-ST} & (\boxed{1} \oplus \boxed{2}) \bigcirc \left\langle \begin{bmatrix} \text{LOC} & \begin{bmatrix} \text{CAT} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{PRD} & + \\ \text{SUBJ} & \boxed{1} \end{bmatrix} \\ \text{COMPS} & \boxed{2} \end{bmatrix} \\ \text{CONT} & \begin{bmatrix} \text{IND} & \boxed{3} \\ \text{LTOP} & \boxed{4} \end{bmatrix} \end{bmatrix} \end{bmatrix} \right\rangle \end{bmatrix} \\ \text{CONT} & \begin{bmatrix} \text{IND} & \boxed{3} \\ \text{LTOP} & \boxed{4} \end{bmatrix} \end{bmatrix} \\ \text{RELS} & \langle\rangle \\ \text{HCONS} & \langle\rangle \end{bmatrix}$$

Languages with free constituent order restrict the lexical item for the copula further in requiring the combination between the predicate and the raised elements to be appended rather than shuffeled. That is, they restrict (66) to (51).

2.8 Raising and Nonlocal Dependencies

The treatment of raising in the lexical entry for the copula in (66) differs in an interesting way from the characterization of raising as it is given in Ginzburg and Sag (2000, 22). Ginzburg and Sag assume the following constraint:

(67) [ARG-ST ⟨ [LOC $\boxed{1}$], [SUBJ ⟨ [LOC $\boxed{1}$]⟩] ⟩]

This version of raising differs from earlier proposals in that only LOCAL values are shared instead of whole *synsem* objects. The reason for this treatment is that one would get problems with the lexical SLASH amalgamation that was suggested by Bouma et al. (2001): if the whole *synsem* object was shared, there would be SLASH amalgamation in the subject and in the phrase from which the subject is raised, an unwelcome result (Ginzburg and Sag, 2000, 21, fn. 8). The problem with (67) is that it is too specific. As was discussed above, the value of SUBJ could be the empty list. A solution seems to be the disjunctive specification of raising verbs that allows for an empty SUBJ list as in (68):

(68) [ARG-ST ⟨ [LOC $\boxed{1}$], [SUBJ ⟨ [LOC $\boxed{1}$]⟩] ⟩] ∨ [ARG-ST ⟨ [SUBJ ⟨ ⟩] ⟩]

Apart from missing a generalization, such a disjunction is not sufficient for German since complements are raised as well and the number of elements on the COMPS list is restricted by performance factors only (Müller, 2004, 220). So if one were to assume an amalgamation account of nonlocal dependencies for German, one would be forced to use a relational constraint that walks through lists and produces a copy of the list that contains elements that share the LOCAL values with the elements of the list from which they are raised. The ARG-ST of raising verbs would then look as follows:

(69) ARG-ST list for German with SUBJ and COMPS raised with a special relational constraint:
[ARG-ST raise($\boxed{1}$) ⊕ raise($\boxed{2}$) ⊕ ⟨ [SUBJ $\boxed{1}$, COMPS $\boxed{2}$] ⟩]

Where *raise* is defined as follows:

(70) raise(⟨⟩) := ⟨⟩.
raise(⟨ [LOC $\boxed{1}$] | Rest ⟩) := ⟨ [LOC $\boxed{1}$] | raise(Rest) ⟩

Note that this is only part of what would be neccessary. As in Ginzburg and Sag's original proposal a lot of things are unspecified: What happens with other features outside of LOCAL (for instance LEX, see Müller, 1996)? Are they shared? If so, this has to made explicit. If not, what is the value of these features? In model theoretic approaches unspecified values of features can have any possible value. This would result in spurious ambiguities or wrong analysis in structures that involve raising, unless one stipulates values.

So, rather than complicating the analysis of raising, we will drop the amalgamation analysis and return to an analysis that introduces nonlocal dependencies in syntax. This can be done through a trace or a unary branching projection. As indicated in several places in this paper, we assume a trace.[23] As Bouma, Malouf and Sag (2001, 29) point

[23] See Bender, 2000, Müller, To appear, and Sag, Wasow and Bender, 2003, 463–464 for arguments that empty elements actually simplify grammatical descriptions.

out, the amalgamation analysis is not necessary to account for extraction path marking phenomena, one of the highlights of the Bouma, Malouf, Sag paper. If adjuncts are registered at a head (either in an adjunct as dependents analysis or via a mechanism of the kind suggested by Levine and Hukari (2006, Chapter 3.7.2)), a pathway marking element can attach to the head and check its SLASH value and the SLASH values that are contributed by the elements in the COMPS list and the SLASH values of the registered adjuncts.

2.9 Predicative Raising-Nouns and *tough* Movement

Doug Arnold brought the following kind of predicative noun phrases to our attention:

(71) a. He is a dead cert/a certainty to win.
b. This is a cinch to prise off.

These nouns are raising nouns[24] and they can only be used predicatively:

(72) a. * A dead cert/a certainty to win came into the room.
b. * A cinch to prise off came into the room.

We assume the lexical entry in (73) for a noun like *cert*.

(73) Lexical entry for the raising noun *cert*:

$$\begin{bmatrix} \text{SYNSEM|LOC} & \begin{bmatrix} \text{CAT} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{PRD} & + \\ \text{SUBJ} & \langle \boxed{1} \rangle \\ \textit{noun} & \end{bmatrix} \\ \text{SPR} & \langle \text{DET} \rangle \\ \text{COMPS} & \langle \text{VP}[\text{SPR} \langle \boxed{1} \rangle]:\boxed{2} \rangle \end{bmatrix} \\ \text{CONT} & \begin{bmatrix} \text{IND} & \boxed{4} \begin{bmatrix} \text{PER} & \textit{3} \\ \text{NUM} & \textit{sg} \\ \textit{index} & \end{bmatrix} \end{bmatrix} \end{bmatrix} \\ \text{RELS} & \left\langle \begin{bmatrix} \text{ARG0} & \boxed{4} \\ \text{ARG1} & \boxed{2} \\ \textit{cert} & \end{bmatrix} \right\rangle \end{bmatrix}$$

This noun is similar to normal nouns in that its semantic contribution is a referential index that provides a variable that has to be bound by the quantifier in the NP. A further similarity is that it takes a determiner as specifier. The noun takes as its complement a VP and raises the missing specifier of this VP (the subject) to its own SUBJ list. The referential index of the noun is linked to the first argument of the relation that is contributed by the noun and the semantic contribution of the VP ($\boxed{2}$) is linked to the second argument.

Since the noun is specified to be PRD+, all projections of this noun are excluded in positions in which non-predicative NPs are required and hence sequences like (72) are ruled out.

[24] This falsifies William's claim (1983, 441) that raising nouns do not exist.

After combination of the lexical item in (73) with the VP complement, the determiner, and possibly some adjuncts, the resulting phrase can function as the daughter in the Predicative NP Projection Schema that was given on page 24. It is then projected to an NP that has an index of type *state*. The resulting NP is compatible with the requirement of the (inflection of the) copula that the predicative argument has to have an index of type *eventuality*.

One thing is missing to make the analysis of sentence like (71) complete: The Predication Schema does not identify the HEAD value of the non-head daughter with the HEAD value of the mother. After all it usually applies to non-predicative NPs and hence, sharing of the HEAD values would cause conflicts in these cases. Therefore the SUBJ value of the raising noun NP is not identified with the SUBJ value in the mother node. This has to be stated explicitly for the cases under discussion:

(74) $$\begin{bmatrix} \text{NON-HEAD-DTRS} \langle [\ \text{SYNSEM|LOC|CAT|HEAD|PRD} + \ ] \rangle \\ \textit{np-pred-phrase} \end{bmatrix} \Rightarrow$$

$$\begin{bmatrix} \text{SYNSEM|LOC|CAT|HEAD|SUBJ } \boxed{1} \\ \text{NON-HEAD-DTRS} \langle [\ \text{SYNSEM|LOC|CAT|HEAD|SUBJ } \boxed{1}\ ] \rangle \end{bmatrix}$$

This constraint says that for all structures of type *np-pred-phrase* with a predicative non-head daughter, the SUBJ value of the mother node is identical to the SUBJ value of the non-head daughter.

The constraint in (74) is the only stipulative part of the analysis, but we see no other way to acount for this data without employing several semantic features for external and internal content of phrases as was done by Kasper (1997).

Figure 14 on the next page shows the analysis of (71a).

Williams (1983, 441) discusses *though* constructions with predicative nouns that are parallel to (75):

(75) a. That word is a bitch to spell.[25]
b. Hair glue is a real bitch to get out of your hair.[26]

Pollard and Sag (1994, Section 4.3) suggest an analysis for *tough* movement that can be combined with the analysis of predicative NPs presented here: *bitch* selects for a VP that contains an extracted object, that is, a VP with an element in SLASH. The object in the SLASH list is coindexed with an NP in the SUBJ list of *bitch*. Apart from this the analysis is parallel to the on of the sentence with *cert*.

3 Alternatives

This section discusses previous proposals in the literature. We start with a lexical rule-based proposal to predication, continue with Van Eynde's non-raising approach, and finish the section with a discussion of Müller's earlier treatment of primary and secondary adjectival predication.

[25] http://www.merriam-webster.com/dictionary/bitch. 07.01.2012.
[26] http://www.myspace.com/laura_galore/photos/36374368. 07.01.2012.

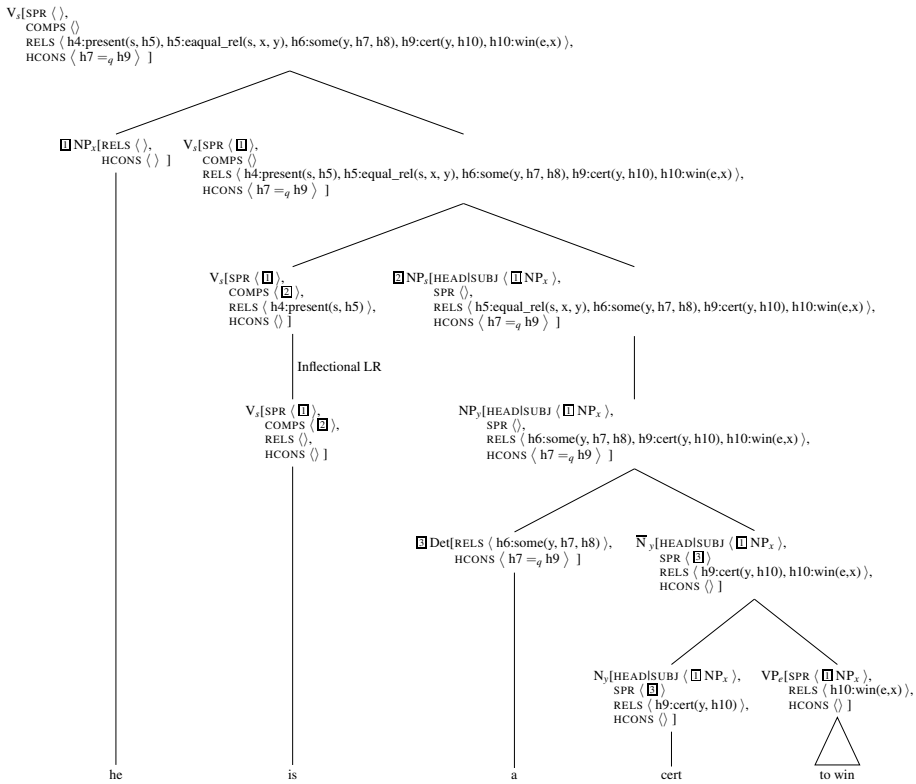

Figure 14: Analysis of *He is a cert to win.*

3.1 Lexical Rules for Predicative Nouns

Pollard and Sag (1994, 360) sketch the lexical rule in (76) that takes nouns as used in normal referential NPs like *a teacher* in (77a) and maps them onto another lexical item that can be used predicatively like in (77b).

(76) $\text{N}[-\text{PRD}, \text{SUBJ}\ \langle\rangle]:[\text{RESTRICTION}\ \boxed{2}]_{\boxed{1}} \mapsto \text{N}[+\text{PRD}, \text{SUBJ}\ \left\langle \text{XP}_{\boxed{1}} \right\rangle]:\boxed{2}$

(77) a. A teacher laughs.
b. John is a teacher.

Ginzburg and Sag (2000, 409) give the following variant of the rule in (76):

(78) Singular Predicative Noun Lexical Rule:

$$\begin{bmatrix} \text{SS}|\text{LOC}|\text{CAT}|\text{HEAD } n \\ \text{ARG-ST } \langle \boxed{1} \rangle \oplus \boxed{A} \\ lx \end{bmatrix} \Longrightarrow_{LR} \begin{bmatrix} \text{SS}|\text{LOC}|\text{CAT} \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{AGR}|\text{NUM } sg \\ \text{PRED } + \end{bmatrix} \\ \text{SPR} & \langle \boxed{1} \rangle \\ \text{SUBJ} & \langle \boxed{2} \rangle \end{bmatrix} \\ \text{ARG-ST } \langle \boxed{2}, \boxed{1} \rangle \oplus \boxed{A} \\ word \end{bmatrix}$$

The lexical rule in (76) adds a subject to the valence features of the noun and by doing so makes it parallel to predicative adjectives. The copula and verbs like *seem* and *consider* are treated as raising verbs that raise the element in SUBJ and make it their own subject or – in the case of *consider* – object.

Pollard and Sag suggest that the set of restrictions of the noun in the input of the rule is represented as the main semantic contribution of the resulting noun.[27] So the contribution of *teacher* in (77b) is $teacher'(\boxed{1})$, while it is $\boxed{1} \| \{teacher'(\boxed{1})\}$ for (77a). As Pollard and Sag point out, this analysis does not extend to proper nouns like those in (1a) – repeated here as (79) – for semantic reasons.

(79) Cicero is Tully.

Like most researchers Pollard and Sag (1987, 66) distinguish between the *be* of predication and the *be* of identity, and hence the lexical rule does not have to account for cases with two proper names or two pronouns.

As Kasper (1997) pointed out in unpublished work[28], the lexical rule-based analysis fails for examples that contain modifiers in the predicative phrase:

(80) He is a good candidate.

The classical analysis of adjuncts assumes that nominal modifiers attach to an $\overline{\text{N}}$ and identify their referential index with the referential index of the noun. But if the semantic contribution of *candidate* is a predicate rather than an index, modification cannot apply as usual.[29] This problem is solved by our analysis. The NP *a good candidate* has the normal NP internal syntax and only the complete NP is mapped onto a predicative NP.

3.2 The Identity Analysis of Predicative Constructions

Van Eynde (2008, 2009, 2012) follows Quine (1960) and Montague (1974, 261) in assuming that the copula always contributes the identity relation. Van Eynde calls his

[27] Note that this is incompatible with the assumptions made in Pollard and Sag, 1994, since it is assumed that the value of RESTRICTIONS is a set of elements of type *psoa* (p. 399), while the nucleus of a predication is of type *psoa*. However, if one assumes a conjunction-based approach for the representation of restrictions (Pollard and Sag, 1994, 330–331, fn. 4), the formulation of the lexical rule can be maintained. So rather than having { red(x), bicycle(x) } as the restriction for *red bicycle* one would assume red(x) & bicycle(x). See Kasper, 1997, 6 and Kolliakou, 1999, 771 for explicit proposals along these lines.

[28] See also Gerbl, 2007, 241.

[29] Assuming an MRS version of Pollard and Sag's Lexical Rule would not help, since one would be forced to assume that the type of the index of *candidate* is not changed by the predication lexical rule. If the type of predicative nouns is indistinguishable from referential nouns, one cannot account for the question tag formation and the pronouns in left dislocation structures that were discussed in Section 1.2.

proposal the identity analysis, while he calls the analysis of Pollard and Sag (1994) the raising analysis.

Van Eynde compares Frege's approach (1892) with Montague's (1974, 261). While Frege assumed that the copula does not contribute semanticly apart from tense information, Montague assumed the representation in (81a):

(81) a. $\lambda P \lambda x P\{\hat{y}[\check{x} = \check{y}]\}$ (copula according to Montague)

b. $\lambda x \exists y[woman(y) \& \check{x} = \check{y}]$ (contribution of the VP *is a woman*)

The Fregean way to represent the semantics of predicative structures is usually assumed in HPSG (Pollard and Sag, 1994; Müller, 2002; this paper), but as we have shown in the preceeding section the selection of one of the two semantic representations for predicative NPs is independent of the raising analysis: We suggested a treatment of predicative NPs that results in a formula that is parallel to the VP representation given in (81b) while keeping the Fregian approach to the copula. Therefore the analysis suggested here has none of the problems that Van Eynde discussed in connection with the traditional HPSG approaches.

In what follows, we want to look at Van Eynde's analysis in detail. Van Eynde (2008, 264–265) suggests the following alternative to the raising analysis: Lexical items for *seems* as in (82a) are constrained by (83) and items like the one that is needed for *consider* in (82b) are constrained by (84).[30]

(82) a. John seems a nice guy.

b. Bob considers his brother a genius.

(83) a1-pred-lex ⇒

$$\begin{bmatrix} \text{ARG-ST} & \langle \text{NP}_{\boxed{1}}\ (,\ \text{PP}_{\boxed{2}}\ ),\ \text{Z}_{\boxed{3}} \rangle \\ \text{SS|LOC|CONT|NUCL} & \begin{bmatrix} \text{EXPERIENCER} & \boxed{2} \\ \text{SOA-ARG|NUCL} & \begin{bmatrix} \text{INST} & \boxed{3}\ \textit{index} \\ \text{THEME} & \boxed{1}\ \textit{index} \\ \textit{coref-rel} & \end{bmatrix} \\ \textit{exp-soa-rel} & \end{bmatrix} \end{bmatrix}$$

(84) a2-pred-lex ⇒

$$\begin{bmatrix} \text{ARG-ST} & \langle \text{NP},\ \text{NP}_{\boxed{2}},\ \text{Z}_{\boxed{3}} \rangle \\ \text{SS|LOC|CONT|NUCL} & \begin{bmatrix} \text{SOA-ARG|NUCL} & \begin{bmatrix} \text{INST} & \boxed{3}\ \textit{index} \\ \text{THEME} & \boxed{2}\ \textit{index} \\ \textit{coref-rel} & \end{bmatrix} \\ \textit{soa-rel} & \end{bmatrix} \end{bmatrix}$$

By assuming these constraints on lexical entries Van Eynde can analyze the sentences in (82) with normal nouns without having to assume a separate predicative lexical item for the predicative usage of the noun or a unary schema that maps non-predicative NPs onto predicative ones. The referential NP is compatible with the specification $\text{Z}_{\boxed{3}}$ and the referential index of the NP will be linked to the theme role of the *coref-rel'* relation.

Van Eynde (2008, 265) assumes that all predicate selectors contribute such semantic information and explicitly includes the copula *be* here. He argues that the dative of judgment depends on the copula, which he takes as evidence for its relational status:

[30] See also Van Eynde, 2009, 369, 372 and Van Eynde, 2012, 363 for similar suggestions.

(85) Es ist mir zu kalt.
it is me.DAT too cold
'It is too cold for me.'

However, traditionally it is said that this dative depends on the *zu* rather than on the copula[31] and there is evidence that casts doubts on Van Eyndes analysis. In the following examples we have *mir zu warme* and *mir zu kalte*, with *zu* present but in a prenominal context in which copulas are hardly ever present:

(86) a. bis auf das mir zu kalte Ziel Spitzbergen[32]
until on the me.DAT too cold goal Spitsbergen
'except for the goal Spitsbergen, which is too cold for me'

b. die mir zu warme Book-Unterseite[33]
the me.DAT too warm bottom.of.the.Book
'the bottom of the Book, which is too warm for me'

In order to have a uniform analysis Van Eynde would have to assume an empty copula in prenominal position that takes an inflected adjective as argument. This is highly implausible, since the copula is hardly ever realized prenominaly and never with inflected adjectives (87b).

(87) a. ?* ein klug seiender Mann
a smart being man

b. * ein kluger seiender Mann
a smart being man

So, the examples with *zu* are not good examples to support Van Eyndes theory, but there are also examples of copula constructions with a dative but without a degree word like *zu* ('to') or *genug* ('enough') being present:

(88) Du bist mir ja ein schöner Vorsitzender!
you.NOM are me.DAT PART a nice chair
'You are a nice chair to me.'

Van Eynde provides parallel Dutch examples. Such sentences are used to express that the speaker thinks that the addressee does not have all properties that are usually assigned to the predicative noun. Such datives should be handled as scopal modifiers that encapsulate the meaning of the predication similar to the semantic representation that

[31] How this is captured in HPSG is a different question. The analysis is not trivial since dative and *zu* can be discontinuous as in (i):

(i) Das Bier ist den Gästen oft zu warm.
the beer is the guests.DAT often too warm
'Often the beer is too warm for the guests.'

We suggest an analysis in which *zu* and *warm* form a complex predicate. *zu* attracts the arguments of the adjective it attaches to and adds the dative. *zu warm* then behaves like *treu* ('faithful') in governing a dative NP.

[32] http://agora2.arte.tv/forum/showthread.php?t=7286. 07.10.2012.

[33] http://www.macuser.de/forum/f10/coolbook-220786/index6.html. 07.10.2012.

was suggested by Van Eynde in (83). But the respective semantic representation is the result of combining a copula construction with an adjunct rather than being part of the specification of the copula that takes a dative as complement.

Another example of datives in copula constructions is shown in (89):

(89) Er war dem König ein treuer Diener.
he.NOM was the king.DAT a faithful servant
'He was a loyal servant of the king.'

We would argue that such datives are adjuncts as well. They are of the type we see in (90):

(90) Er bemalt dem König den Tisch.
he.NOM paints the king.DAT the table.ACC
'He paints the table for the king.'

The verb *bemalen* ('paint') is a transitive verb and the dative is a modifier that can be used to express the benefactive/malefactive of the event (Wegener, 1985).[34]

Van Eynde's analysis works for the examples he discusses in his paper, but the argumentation against the raising analysis is not convincing. In addition, the copula-based analysis faces several problems.

The first problem is that pronouns and proper names cannot be used as predicates in such constructions:[35]

(91) a. * He seems him.
b. * He seems John Malkovich.

Here the copula has to be used:

(92) a. He seems to be him.
b. He seems to be John Malkovich.

The same is true for gerunds and infinitives if the subject of the infinitive is not realized as the subject of *seems*:

[34]Since such datives interact with the dative passive (Müller, 2006, 860), they are probably licensed by a lexical rule that adds the dative to the argument list of a verb.

[35]Frank Van Eynde (p. c. 2012) pointed out to me that it is possible to have pronouns as complements of *seem*. (i) is an attested example:

(i) When she meets Carmilla, she seems somebody that she could be friends with
(http://www.examiner.com/review/theatrical-review-of-wildclaw-theatre-s-carmilla, 08.01.2013)

However, the phrase *somebody that she could be friends with* is an internally complex phrase that can be turned into a predicate just like *a man* or *a man she could be friends with*. This is different from personal pronouns like *him*, which just point to a referent without providing any quantificational or relational information.

Frank Van Eynde provides the example in (ii) that is supposed to show that proper names can be used in predicate positions:

(ii) I call him George.

We would argue that this *call* differs from the one in *I call him a liar*. The *call* in (ii) just mentions the name, it does not establish a predicative relation between *him* and *George*.

(93) a. * The greatest pleasure on earth seems eating oysters ....
b. * His main worry now seems to get rid of his detractors.
c. The greatest pleasure on earth seems to be eating oysters ....
d. His main worry now seems to be to get rid of his detractors.

This difference is captured by an analysis that treats *seem* as a raising verb and assumes that there is an equational copula *be*. Since *seem* does require a phrase of type *eventuality* as complement, non-predicative NPs like *eating oysters* are excluded as non-subject argument of the copula. Infinitival constructions like (93b) are ruled out by our analysis since *his main worry* is incompatible with the subject requirement of *to get rid of his detractors*. (93c,d) are accepted as well-formed, since the identity copula can be combined with gerunds and infinitives. So, while the contrasts in (93) follow from the raising analysis, it is unclear how they can be explained in Van Eynde's analysis.

Secondly, there seems to be no way to account for the differences in question tags and pronouns in left dislocation structures that were discussed in Subsection 1.1. In the type shifting analysis we have predicative NPs and they combine with the pronoun *it*/*det*/*das* in question tags or left dislocation structures rather than with *he*/*han*/*er*, *she*/*hun*/*sie*. But in Van Eyndes analysis the work is done by the copula and there are no different NP and AP types, hence there is no explanation for question tag formation and left dislocation.

In addition there is a very general problem of the analysis: It does not extend to predicates with an expletive subject as in (18) – repeated here as (94a) – or predicates that do not have a subject at all as for instance the examples in (19) – (19a) is repeated here as (94b).

(94) a. In der Mensa ist es laut.
in the commons is it.EXPL loud
'It is loud in the commons.'
b. weil schulfrei ist
because school.free is
'because there is no school'

In both cases there is nothing present that could be "coreferential" with the adjectival predicate. Van Eynde (presentation at HPSG 2009) suggests that the THEME role of the *coref-rel′* is optionally filled: that is, in the case of expletives there is no index linked to THEME. He argues that this is parallel to cases like (95):

(95) a. He eats pizza.
b. He eats.

In (95b) the object of *eats* remains implicit. Note that this analysis introduces a disjunction in the lexical item for the copula, namely a disjunction between referential and expletive indices of the subject NP. In addition one would need another disjunction that accounts for the fact that the subject can be missing altogether. Therefore one would have to have three versions of the copula: one for clauses with referential subjects, one for clauses with expletive subjects, and one for clauses without subject. The big problem for such a proposal is that it has to be ensured that the right copula is used with the right embedded predicate. For instance it is impossible to use (19b) with a subject:

(96) * weil der Mann ihm schlecht ist
because the man.NOM him.DAT sick is

Similarly, expletives are impossible in normal prediative constructions:

(97) Es ist klug.
it is smart
'He/she is smart.'

(97) does not have a reading in which nobody is smart or there is generic smartness. The *es* has to be referential and it has to refer to something that has neuter gender as for instance *Mädchen* ('girl') or *Bürschlein* ('boy'). This means that the subject of the copula has to be expletive if and only if the embedded predicate requires for an expletive. It can be missing if and only if the embedded predicate does not require a subject. This is best captured by a raising analysis.

3.3 Special Valence Features for Predicate Selection

Some authors have suggested using a special valence feature called XCOMP or VCOMP for the selection of an argument that enters predicate complex formation (see Chung, 1993 for Korean, Rentier, 1994 for Dutch, and Müller, 1997, 2002 and Kathol 1998; 2000, Chapter 8 for German). Müller (2002, 103) extended the verb complex analysis of other authors to copula constructions and resultative secondary predicates. He gave the following lexical item for the copula:

(98) *sein* (predicative copula, according to Müller (2002, 103)):

$$\begin{bmatrix} \text{SUBCAT} & \boxed{1} \oplus \boxed{2} \\ \text{XCOMP} & \left\langle \begin{array}{l} \text{ADJ}[\text{MOD } \textit{none}, \text{ PRD } +, \text{ SUBJ } \boxed{1}, \text{ SUBCAT } \boxed{2}, \\ \quad \text{XCOMP } \langle\rangle, \text{ LEX } +] \end{array} \right\rangle \end{bmatrix}$$

The copula raises both the subject, if there is one ($\boxed{1}$), and other arguments of the embedded adjective ($\boxed{2}$). The predicative adjective is required to be LEX+. Therefore it forms a complex with the copula directly and all its arguments are raised.

The problem with this lexical item is that it specifically selects a predicative adjective. Müller selected all verbs that take part in complex formation via XCOMP, but those that were realized as full phrases – that is in so-called incoherent constructions – were selected via SUBCAT (COMPS in the notation we use here). The problem that results from this treatment is that two lexical items for the predicative copula are needed, one that selects NP and PP predicates and one for adjectival predicates. Similarly the lexical rule for resultative predication selects the result predicate via XCOMP. Since both PPs and adjectives can function as the result predicate in German but only structures with adjectives fulfill the criteria for coherent constructions, a more general treatment of the facts is desirable.

In the analysis presented here, the lexical item for *cut* as used in (99) is (100).

(99) Er schneidet die Zwiebel klein / in Stücke.
he cuts the onions small into pieces

(100) ARG-ST for *schneid-/cut-* as used in the resultative construction:

$$\left[\text{ARG-ST}\ \langle\ \text{NP}\ \rangle \oplus \boxed{1} \oplus \langle\ [\text{PRD+},\ \text{SUBJ}\ \boxed{1}\ \langle\ \text{NP}_{ref}\ \rangle,\ \text{COMPS}\ \langle\rangle]\ \rangle\right]$$

This lexical item is not special to German. It is the same for English and Danish (and other languages, see Verspoor, 1997, Wechsler, 1997, and Wechsler and Noh, 2001 for analyses of English and Korean). German forms a predicate complex, but English and Danish do not. This is a fact about the syntax of the respective languages but it is not represented in the lexical items. Hence, crosslinguistic generalizations are captured better in the analysis presented here.

4 Conclusion

This paper provides the basic building blocks for predicational and specificational constructions.

We have shown that the arguments provided by Van Eynde for an identity analysis without raising are not convincing. In addition, in his analysis there are problems with pronouns in predication structures, the analysis cannot account for question tags and pronouns in left dislocation structures, and the analysis does not extend to subjectless constructions.

We suggest returning to a raising analysis of predication that raises the complete value of SUBJ of the embedded predicate rather than identifying LOCAL values of raised subjects. The predication lexical rule was recoded as a unary branching immediate dominance schema, which allows the inclusion of modifiers in the NP. In addition it was suggested to dispense with the XCOMP feature and to return to a COMPS-based analysis in which predicative and non-predicative arguments are selected uniformly via COMPS. This makes it possible to treat the various predication structures as optionally coherent constructions and to account for intraposed APs.

The analysis has been implemented in the TRALE system (Meurers, Penn and Richter, 2002; Penn, 2004; Müller, 2007a) as part of grammar fragments of German, Danish (Müller and Ørsnes, 2011, In Preparation), and English. These grammars are developed in the CoreGram project[36] and share a core grammar with grammars for Persian (Müller, 2010), Mandarin Chinese (Müller and Lipenkova, 2009), Maltese (Müller, 2009), and Yiddish (Müller and Ørsnes, 2011). The respective grammars can be downloaded at http://hpsg.fu-berlin.de/Software/.

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