Persian
in Head-Driven Phrase Structure Grammar

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Draft
comments welcome!

Preface

CoreGram
German
Persian
Maltese
Mandarin Chinese
Yiddish
English
Spanish
French
Spanish
BerliGram
DanGram

The Project

This book is part of a larger project, called CoreGram, with the goal to develop large scale computer processable grammar fragments of several languages that share a common core. Currently we work on the following languages:

- German (Müller, 2008, 2009b; Müller and Ørsnes, 2011)
- Danish (Ørsnes, 2009; Müller, 2009b; Müller and Ørsnes, 2011, To appear)
- Persian (Müller, 2010b; Müller and Ghayoomi, 2010; Müller, Samvelian and Bonami, In Preparation)
- Maltese (Müller, 2009a)
- Mandarin Chinese (Lipenkova, 2009; Müller and Lipenkova, 2009)
- Yiddish (Müller and Ørsnes, 2011)
- English
- Spanish
- French

For the implementation we use the TRALE system (Meurers, Penn and Richter, 2002; Penn, 2004), which allows for a rather direct encoding of HPSG analyses (Melnik, 2007). The grammars of German, Danish, Persian, Maltese, and Mandarin Chinese are of non-trivial size and can be downloaded at http://hpsg.fu-berlin.de/Projects/core.html. They are also part of the version of the Grammix CD-rom (Müller, 2007a) that is distributed with this book. The grammars of Yiddish and English are toy grammars that are used to verify cross-linguistic analyses of special phenomena and the work on Spanish and French is part of work in the Sonderforschungsbereich 632 which just started. See Bildhauer, 2008 for an implemented grammar of Spanish that will be converted into the format of the grammars mentioned above.

We believe that books are the best way to document such fragments since it is often not possible to construct a coherent view of one language from journal articles. The reason is that journal articles tend to need a long time from first submission to final publication and sometimes basic assumptions may have changed during the development of the linguistic theory in the meantime. The first book in this series was Müller, 2008, which describes a fragment of German that is implemented in the grammar BerliGram. Another book on the Danish Grammar developed in the DanGram project is in preparation (Müller and Ørsnes, To appear).

The situation in mainstream formal linguistics has often been criticized: basic assumptions are changed in high frequency, sometimes without sufficient motivation. Some concepts are not worked out in detail and formal underpinnings are unclear (see for instance Gazdar, Klein, Pullum and Sag, 1985, p. 6; Pullum, 1985, 1989, 1991, p. 48; Kornai and Pullum, 1990; Kuhns, 1986, p. 550; Crocker and Lewin, 1992, p. 508; Kolb

language acquisition|(
Universal Grammar (UG)|(
Poverty of the Stimulus
Construction Grammar (CxG)
Japanese
English
German
Basque

and Thiersch, 1991, p. 262; Kolb, 1997, p. 3–4; Freidin, 1997, p. 580; Veenstra, 1998, p. 25, 47; Lappin et al., 2000, p. 888; Stabler, 2010, p. 397, 399, 400; Fanselow, 2009). For a more detailed discussion of this point see Müller, 2010a, Chapter 3.7. As already mentioned, we work in the framework of HPSG, which is well-formalized (King, 1999; Pollard, 1999; Richter, 2004) and stable enough to develop larger fragments over a longer period of time. HPSG is a constraint-based theory which does not make any claims on the order of application of combinatorial processes. Theories in this framework are just statements about relations between linguistic objects or between properties of linguistic objects and hence compatible with psycholinguistic findings and processing models (Sag and Wasow, 2011).

As is argued in Müller, 2010a, Chapter 11.4, HPSG is compatible with UG-based models of language acquisition as for instance the one by Fodor (1998). See Fodor, 2001, p. 385 for an explicit remark to that end. However, in recent years evidence has accumulated that arguments for innate language specific knowledge are very weak. For instance, Johnson (2004) showed that Gold's proof that natural langauges are not identifiable in the limit by positive data alone (Gold, 1967) is irrelevant for discussions of human language acquisition. Furthermore, there is evidence that the input that humans have is sufficiently rich to aquire structures which were thought by Chomsky (1971, p. 29–33) and others to be inacquirable: Bod (2009) showed how syntactic structures could be derived from an unannotated corpus by Unsupervised Data-Oriented Parsing. He explained how Chomsky's auxiliary inversion data can be captured even if the input does not contain the data that Chomsky claims to be necessary (see also Eisenberg, 1992 and Pullum and Scholz, 2002; Scholz and Pullum, 2002 for other Poverty of the Stimulus arguments). Input-based models of language acquisition in the spirit of Tomasello (2003) seem highly promising and in fact can explain language acquisition data better than previous UG-based models (Freudenthal et al., 2006, 2009). We argued in Müller, 2010a that the results from language acquistion reasearch in the Construction Grammar framework can be carried over to HPSG, even in its lexical variants.[1] If language acquisition is input-based and language-specific innate knowledge is minimal as assumed by Chomsky (1995); Hauser, Chomsky and Fitch (2002) or non-existing, this has important consequences for the construction of linguistic theories: Proposals that assume more than 400 morpho-syntactic categories that are all innate and that play a role in all languages of the world even though they are not directly observable in many languages (Cinque and Rizzi, 2010) have to be rejected right away. Furthermore, it cannot be argued for empty functional projections in language X on the basis of overt morphems in language Y. This has been done for Topic Projections that are assumed for languages without topic morphemes on the basis of the existence of a topic morpheme in Japanese. Similarly, functional projections for object agreement have been proposed for languages like English and German on the basis of Basque data even though neither English nor German has object agreement. Since German children do not have any evidence from

[1] In fact we believe that a lexical treatment of argument structure is the only one that is compatible with the basic tenets of theories like Categorial Grammar (CG), Lexical Functional Grammar (LFG), CxG, and HPSG that adhere to lexical integrity (Bresnan and Mchombo, 1995). For discussion see Müller, 2006, Müller, 2010a, Chapter 11.11, Müller, 2010b, and Müller, Submitted.

language acquisition|)
Universal Grammar (UG)|)
Government and Binding (GB)@*Government and Binding* (GB)
Minimalism
Construction Grammar (CxG)!Sign-Based
Construction Grammar (CxG)!Embodied

Basque, they would not be able to acquire that there are projections for object agreement and hence this fact would have to be known in advance. Since there is no theory external evidence for such projections, theories that can do without such projections and without stipulations about UG should be preferred. However, this does not mean that the search for universals or for similarities between languages and language classes is fundamentally misguided, although it may be possible that there is very little that is truely universal (Evans and Levinson, 2009): In principle there exist infinitely many descriptions of a particular language. We can write a grammar that is descriptively adaquate, but the way the grammar is written does not extend to other languages. So even without making broad claims about all languages it is useful to look at several languages and the more they differ from each other the better it is. What we try to do here in this book and in the CoreGram project in general is the modest version of main stream generative grammar: We start with grammars of individual languages and generalize from there. We think that the framework we are using is well-suited for capturing generalizations within a language and across languages, since inheritance hierachies are ideal tools for this (see Section 2.6). Of course when building grammars we can rely on several decades of research in theoretical linguistics and build on insights that were found by researchers working under UG-oriented assumptions. Without a theory-driven comparative look at language certain questions never would have been asked and it is good that we have such valuable resources at hand although we see some developments rather critical as should be clear from the statements we made above.

Returning to formalization of linguistic theories, the same criticism that applies to GB/ Minimalism applies to Construction Grammar: The basic notions and key concepts are hardly ever made explicit with the exception of Sign-Based Construction Grammar (Sag, 2010, To appear), which is an HPSG-variant, Embodied Construction Grammar (Bergen and Chang, 2005), which uses feature value matrices and is translatable into HPSG (see Müller, 2010a, Chapter 9.6 for the discussion of both theories), and Fluid Construction Grammar (Steels, 2011). Müller (2010a, Chapter 3.6.4; Submitted) showed that the combinatory operations of Minimalism as defined in Chomsky, 2008 and Stabler, 2001 corresponds to three of the schemata used in HPSG grammars since at least Pollard and Sag, 1994: Merge corresponds the Head-Specifier Schema and the Head-Complement Schema of HPSG and Move corresponds to the Head-Filler Schema. So HPSG can be said to provide an explicit formalization of Minimalist ideas. HPSG differs from Minimalism in important respects though: It is constraint-based rather than generative-enumerative. The implications of this cannot be discussed in full detail here, but the interested reader is referred to Pullum and Scholz, 2001 and Müller, 2010a, Chapter 11.2. In addition we agree with Jackendoff (2008, 2011), Jacobs (2008), Sag (2010), and others that Move and Merge are not sufficient to deal with language in its full richness in non-stipulative ways. Hence we believe that additional schemata or phrasal constructions in the sense of CxG or Simpler Syntax (Culicover and Jackendoff, 2005) are needed. To what extent phrasal constructions are needed and where Merge-like combinations together with a rich lexicon are sufficient or rather necessary is an empirical issue and the present book tries to contribute to this discussion.

The Data

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Berlin and Paris, Friday 2nd November, 2012 Stefan Müller, Pollet Samvelian and Olivier Bonami

A Note on the Way this Book is Published

This book is available for download at http://hpsg.fu-berlin.de/~stefan/Pub/persian.html. We hope to publish it as part of the Open Access series *Implemented Grammars* that is currently established as part of a larger Open Access initiative for publishing linguistic books (OALI). The final approval of the series concept and series editors is still pending but we hope that the process of self organization of the Open Access initiative will be finished by the end of the year.

The interested reader will find more information about OALI on its web page at http://hpsg.fu-berlin.de/OALI/ and some further background in my *Personal Note on Open Access in Linguistics* (Müller, To Appear).

Berlin, Friday 2nd November, 2012 Stefan Müller

Contents

2. A Brief Introduction to Head-Driven Phrase Structure Grammar

Head-Driven Phrase Structure Grammar (HPSG) was developed by Ivan Sag and Carl Pollard in the mid 80s. The main publications are Pollard and Sag, 1987, 1994. International conferences have been held since 1994 and there is a rich collection of publications regarding analyses of linguistic phenomena (in the area of phonology, morphology, syntax, semantics, and information structure), formal foundations of the framework, and computational issues like efficient parsing and generation. See http://hpsg.fu-berlin.de/HPSG-Bib/ for bibliographic data.

Since HPSG analyses are usually sufficiently formalized they can and have been implemented as computer processable grammars. This makes it possible to check the interactions of analyses with other phenomena and to use the linguistic knowledge in practical applications. See Bender et al., In Preparation for further details.

2.1. Formal Foundations

HPSG assumes feature structures as models of linguistic objects. Feature structures consist of feature value pairs. The values can be atomic or feature structures. Every feature structure is of a certain type. Types are ordered in hierarchies with the most general type at the top of the hierarchy and the most specific types at the bottom. Figure 2.1 shows an example hierarchy for the type *case* and its subtypes. Types in

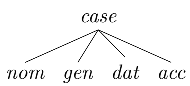

Figure 2.1.: Subtypes of *case* in a grammar of German

a model of a linguistic object are maximally specific, that is, a noun or an attributive adjective in a model of an actual utterance has a case value that is *nom*, *gen*, *dat*, or *acc*. The linguist develops theories that describe possible feature structures. In contrast to feature structures, feature descriptions can be partial. For instance it is not necessary to specify a case value for the German word *Frau* ('woman') since *Frau* can be used in NPs of all four cases. (1) shows a simplified description of the nominal agreement information for the German noun *Frau* ('woman') (see Kathol, 1999 for details and Wechsler and Zlatić, 2003 for a comprehensive overview of agreement in HPSG). *Frau* has feminine gender, is compatible with all four cases, and is singular. The AVM has the type *nom-agr*. Types are written in italics. *nom-agr* is a complex type which introduces the features GEN, CASE, and NUM. *fem*, *case*, *sg* are also types, but they are atomic.

fem and *sg* are maximally specific, since they do not have subtypes, but *case* does have subtypes.

(1) $$\begin{bmatrix} \textsc{gen} & \textit{fem} \\ \textsc{case} & \textit{case} \\ \textsc{num} & \textit{sg} \\ \textit{nom-agr} & \end{bmatrix}$$

One very important part of the formalism is structure sharing. It is used to express that information in feature structures is identical. Structure sharing is indicated by boxed numbers in feature descriptions. An identical number at several places in an AVM expresses the fact that the respective values are identical.

To give an example of structure sharing, the agreement information of a noun in German has to be compatible with the agreement information of the adjective and the determiner. This compatibility is established by identifying a part of the structure that represents a noun with parts of the structure for the adjective and the determiner in an NP. In an analysis of (2), the definite article has to be compatible with the description in (1).

(2) die Frau
the woman

die is ambiguous between feminine singular nominative/accusative and plural nominative/accusative.

(3) $$\begin{bmatrix} \textsc{gen} & \textit{fem} \\ \textsc{case} & \textit{nom} \vee \textit{acc} \\ \textsc{num} & \textit{sg} \\ \textit{nom-agr} & \end{bmatrix} \vee \begin{bmatrix} \textsc{case} & \textit{nom} \vee \textit{acc} \\ \textsc{num} & \textit{pl} \\ \textit{nom-agr} & \end{bmatrix}$$

Since *Frau* is singular, only feminine singular nominative/accusative is compatible with this noun. The result of identifying the feature bundles of *die* and *Frau* therefore is (4):

(4) $$\begin{bmatrix} \textsc{gen} & \textit{fem} \\ \textsc{case} & \textit{nom} \vee \textit{acc} \\ \textsc{num} & \textit{sg} \\ \textit{nom-agr} & \end{bmatrix}$$

While structure sharing is the most important expressive means in HPSG there is one extension of the basic formalism that plays a crucial role in most HPSG analyses: relational constraints. Relational constraints are used to relate several values in a feature structure to each other. The relational constraint that is used most often in HPSG is *append* ('$\oplus$'). *append* is used to concatenate two lists. Schema 1, which will be discussed in Section 2.2.2, is an example for an application of such a constraint.

This brief sketch basically described all the formal tools that are used in HPSG. Of course a lot more could be and has been said about the properties of the formalisms, but this introductory section is not the place to discuss these issues in detail. However, it cannot be emphasized enough that it is important that the formal details are worked out and the interested reader is referred to the work of Shieber (1986), Pollard and Sag (1987, Chapter 2), Johnson (1988), Carpenter (1992), King (1994, 1999), Pollard (1999) and Richter (2004). The work of King, Pollard, and Richter reflects current assumptions, that is, the model theoretic view on grammar that is assumed nowadays.

Before I start to discuss several phenomena and their analyses in HPSG in the following sections I want to give an overview of the general feature geometry as it was developed in Pollard and Sag, 1994. (5) shows parts of the lexical item for *Frau* ('woman').

(5)
$$\begin{bmatrix} \text{PHONOLOGY} & \langle \textit{frau} \rangle \\ \text{SYNTAX-SEMANTICS} & \begin{bmatrix} \text{LOCAL} & \begin{bmatrix} \text{CATEGORY} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{AGR} & \boxed{1}\begin{bmatrix} \text{GEN} & \textit{fem}\\ \text{CASE} & \textit{case}\\ \text{NUM} & \textit{sg} \\ \textit{nom-agr} & \end{bmatrix} \\ \textit{noun} & \end{bmatrix} \\ \text{SPR} & \left\langle \text{DET}[\text{AGR}\ \boxed{1}]\right\rangle \\ \textit{category} & \end{bmatrix} \\ \text{CONTENT} & \ldots \begin{bmatrix}\text{INST} & X \\ \textit{frau} & \end{bmatrix} \\ \textit{local} & \end{bmatrix} \\ \text{NONLOCAL} & \ldots \\ \textit{synsem} & \end{bmatrix} \\ \textit{word} & \end{bmatrix}$$

The first feature value pair describes the phonological form of the word. The value of PHON is a list of phonemes. For reasons of readability usually the orthographic form is given in HPSG papers and phonological structure is omitted, but see Bird and Klein, 1994 and Höhle, 1999 for analyses. 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, see Section **??**). 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. The value of AGREEMENT (AGR) is the one given in (1). 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 (see the next section for details on valence). The $\boxed{1}$ is an example of structure sharing. It ensures that the specifier that is realized together with the noun has compatible agreement features.

2.2. Valence and Constituent Order

2.2.1. 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). (6) gives some prototypical examples for ARG-ST values.

(6)

Verb	ARG-ST	SPR	COMPS
sleeps	⟨ NP[*nom*] ⟩	⟨ NP[*nom*] ⟩	⟨ ⟩
likes	⟨ 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 (6) 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) and Pullum (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 (6).

The HPSG representation of valence is reminiscent of Categorial Grammar (Ajdukiewicz, 1935; Steedman, 2000) where each head comes with a description of its arguments. Figure 2.2 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. Therefore accusative NPs like *him* are excluded as a subject of *sleeps*. The

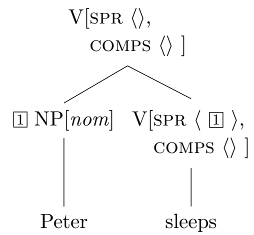

Figure 2.2.: Analysis for *Peter sleeps*.

elements in valence lists are canceled off once the combination with an 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 2.3 shows a more complex example with a transitive verb. *likes* and *Sandy* form a VP (a verbal projection with an empty COMPS

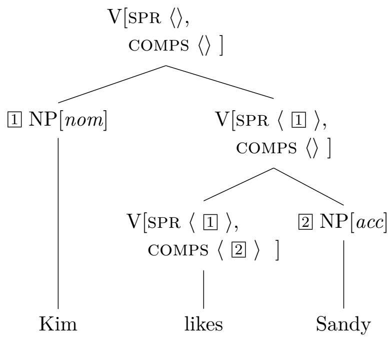

Figure 2.3.: Analysis for *Kim likes Sandy.*

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

2.2.2. Constituent Structure

As was explained in Section 2.1, 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 2.4 is shown in (7).

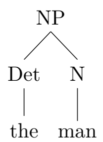

Figure 2.4.: *the man*

(7)
$$\begin{bmatrix} \text{PHON} & \langle \textit{ the man } \rangle \\ \text{HEAD-DTR} & \begin{bmatrix} \text{PHON} \ \langle \textit{ man } \rangle \end{bmatrix} \\ \text{NON-HEAD-DTRS} & \left\langle \begin{bmatrix} \text{PHON} \ \langle \textit{ the } \rangle \end{bmatrix} \right\rangle \end{bmatrix}$$

For explanatory purposes (7) shows the phonological information only. Part of speech information and valence information that is contained in the tree in Figure 2.4 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 ⇒
$$\begin{bmatrix} \text{SYNSEM|LOC|CAT|COMPS} \ \boxed{1} \\ \text{HEAD-DTR|SYNSEM|LOC|CAT|COMPS} \ \langle \ \boxed{2} \ \rangle \oplus \boxed{1} \\ \text{NON-HEAD-DTRS} \ \left\langle \begin{bmatrix} \text{SYNSEM} \ \boxed{2} \end{bmatrix} \right\rangle \end{bmatrix}$$

This constraint splits the COMPS list of the head daughter into two parts: a list that contains exactly one element (⟨ $\boxed{2}$ ⟩) 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 *likes* in Figure 2.3 is identified with the feature value bundle that corresponds to the properties of the object that is combined with the head (*Sandy* in the case of Figure 2.3). 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. The constraints can be specified in a way that allows for the realization of any number of complements in one go. See for instance Pollard and Sag, 1994 for an analysis of English with a flat VP and Bouma and van Noord (1998) for an absolutely flat analysis of Dutch, including a flat verbal complex.

The Schema 1 licences the VP in Figure 2.3. The combination of the VP and its specifier is licenced by the Head-Specifier-Schema:[1]

Schema 2 (Specifier-Head-Schema)
head-specifier-phrase ⇒
$$\begin{bmatrix} \text{SYNSEM|LOC|CAT|SPR} \ \boxed{1} \\ \text{HEAD-DTR|SYNSEM|LOC|CAT|SPR} \ \boxed{1} \oplus \langle \ \boxed{2} \ \rangle \\ \text{NON-HEAD-DTRS} \ \left\langle \begin{bmatrix} \text{SYNSEM} \ \boxed{2} \end{bmatrix} \right\rangle \end{bmatrix}$$

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

[1] Note that the non-head daughter is taken from the end of the SPR list, while the non-head daughter in head-complement phrases is taken from the beginning. For heads that have exactly one specifier this difference is irrelevant, but in the analysis of object shift and negation shift that is suggested by Müller and Ørsnes (To appear), the authors assume multiple specifiers and the difference in order of combination will be relevant.

2.2.3. Constituent Order

In the simple NP example above the order of the elements is fixed: the head follows the non-head. However this is not always the case. For instance there are mixed languages like Persian that allow some heads to the left of their arguments and some heads to the right (Prepositional phrases are head initial and verb phrases are head final in Persian). For such reasons HPSG assumes a separation between immediate dominance (ID) constraints and linear precedence (LP) constraints as was common in GPSG (Gazdar et al., 1985). For instance, Schema 1 does not impose any order on the head and the non-head. This is taken care of by a set of separate constraints.

Heads that precede their complements can be marked as INITIAL+ and those which follow their complements as INITIAL−. The following LP constraints ensure the right ordering of heads with respect to their complements:

(8) a. HEAD [INITIAL+] < COMPLEMENT
b. COMPLEMENT < HEAD [INITIAL−]

2.2.4. 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 the linearization constraint in (8a), 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 the schema is given as Schema 3:

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

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

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. 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 2.5 and 2.6 show the analysis of the German sentences in (9):

(9) 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

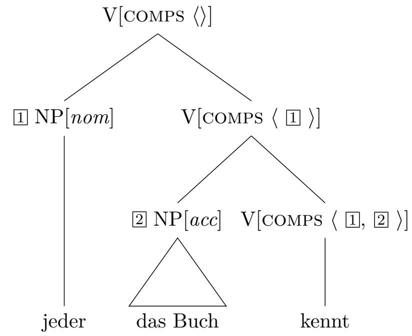

Figure 2.5.: Analysis of *jeder das Buch kennt* (everybody the book knows)

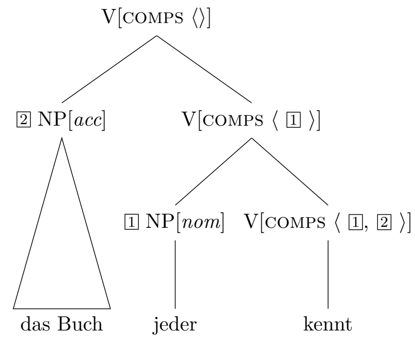

Figure 2.6.: Analysis of *das Buch jeder kennt* (the book everybody knows)

In Figure 2.5 the object is combined with the verb first and the subject is represented in the COMPS list of the mother and in Figure 2.6 the subject is combined with the verb first and the object is represented in the COMPS list of the mother. 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 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.

For authors who assume binary branching structures 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.

To sum up, there are three approaches to free constituent order: Flat structures, linearization domains with discontinuous constituents, and the non-cancellation of syntactic and semantic properties of arguments.

2.2.5. Heads and Projection of Head Features

Section 2.1 introduced head features and Figure 2.3 shows that the information about part of speech of the head is present at every projection, but until now nothing has been said about head feature propagation. The identity of the head features of a head and of a mother node is taken care of by the following principle:

Principle 1 (Head Feature Principle) *In a headed phrase, the* HEAD *value of the mother and the* HEAD *value of the head daughter are identical.*

This can be formalized by the following implicational constraint:

(10) *headed-phrase* ⇒

$$\begin{bmatrix} \text{SYNSEM|LOCAL|CAT|HEAD } \boxed{1} \\ \text{HEAD-DTR|SYNSEM|LOCAL|CAT|HEAD } \boxed{1} \end{bmatrix}$$

The head daughter is the daughter that contains the syntactic head, that is, in the phrase *likes Sandy* in Figure 2.3 it is the lexical item *likes* and in the phrase *Kim likes Sandy* it is the constituent *likes Sandy*. The constraint is a constraint on structures of type *headed-phrase*. Types like *head-complement-phrase* and *head-specifier-phrase* are subtypes of *headed-phrase* and hence the constraint in (10) applies to them too.

2.3. Non-Cancellation of Valence Requirements

2.4. Semantics

The first publications on HPSG assumed Situation Semantics (Barwise and Perry, 1983) as the underlying semantic framework (Pollard and Sag, 1987, 1994). While there are

also more recent publications in this tradition (Ginzburg and Sag, 2000), many current analyses use semantic formalisms that allow for the underspecification of scope constraints such as for instance Minimal Recursion Semantics (MRS, Copestake, Flickinger, Pollard and Sag, 2005) and Lexical Resource Semantics (LRS, Richter and Sailer, 2004).

2.4.1. Minimal Recursion Semantics

(11) shows the examples for the semantic contribution of a noun and a verb in Minimal Recursion Semantics (MRS):

(11) a. *dog*

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

b. *chases*

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

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 (11a) or an event variable (11b). 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. (12) 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′*.

(12) *chase*:

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

Generalizations over linking patterns can be captured elegantly in inheritance hierarchies (see Section 2.6 on inheritance hierarchies and Davis, 1996; Wechsler, 1991; Davis and Koenig, 2000 for further details on linking in HPSG).

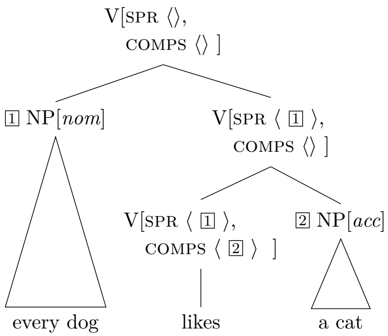

Figure 2.7.: Analysis for *Every dog chases a cat.*

Before turning to the compositional analysis of (13a), I want to introduce some additional machinery that is needed for the underspecified representation of the two readings in (13b,c).

(13) 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. (14) shows a (simplified) MRS representation for (13a).

(14) ⟨ 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 (13) are equivalent to the results of the scope resolution process that is described below.

The MRS in (14) can best be depicted as in Figure 2.8. 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 (14). This is indicated by the dashed lines in Figure 2.8 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:

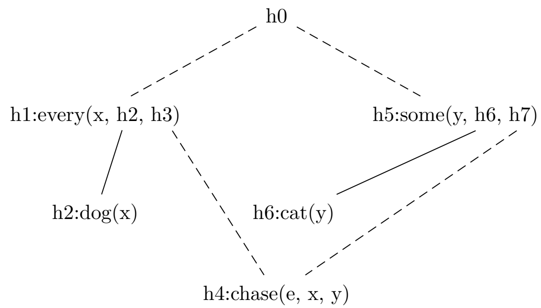

Figure 2.8.: Dominance graph for *Every dog chases some cat.*

(15) 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 2.9 and Figure 2.10.

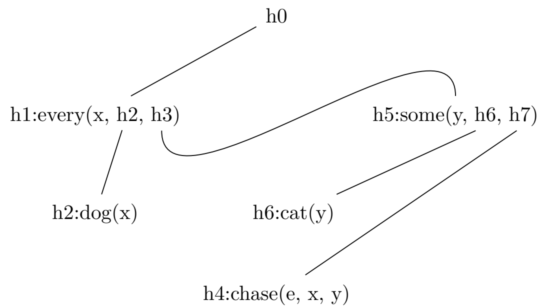

Figure 2.9.: every(x,dog(x),some(y,cat(y),chase(x,y)))

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 (16) both slots of a quantifier have to stay open.

(16) a. Every nephew of some famous politician runs.
b. every(x, some(y, famous(y) politician(y), nephew(x, y)), run(x))
c. some(y, famous(y) politician(y), every(x, nephew(x, y), run(x)))

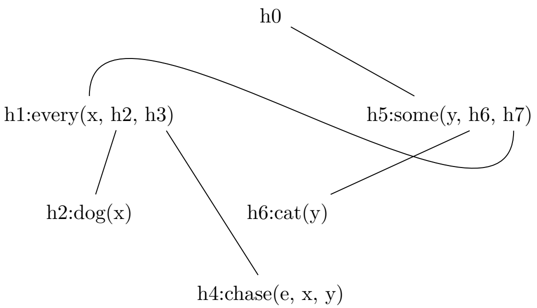

Figure 2.10.: some(y,cat(y),every(x,dog(x),chase(x,y)))

In the analysis of example (13a), the handle of *dog′* was identified with the restriction of the quantifier. This would not work for (16a) since either *some′* or *nephew′* can be the restriction of *every′*. Instead of direct specification so-called handle constraints are used (*qeq* oder $=_q$). 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 (13a) is given in (17).

(17) ⟨ 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 } ⟩

The handle constraints are associated with the lexical entries for the respective quantifiers. Figure 2.11 shows the analysis. For compositional cases as in Figure 2.11, 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.

2.4.2. The Analysis of Non-Compositional Constructions

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 (18):

`feature!`C-CONT

`feature!`HOOK

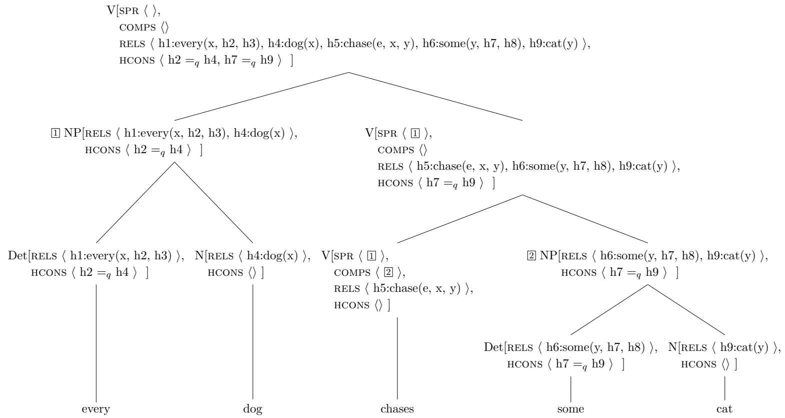

Figure 2.11.: Analysis for *Every dog chases a cat.*

(18)
$$\begin{bmatrix} \text{HOOK} & \begin{bmatrix} \text{INDEX} & \textit{event-or-index} \\ \text{LTOP} & \textit{handle} \end{bmatrix} \\ \text{RELS} & \textit{list of relations} \\ \text{HCONS} & \textit{list of handle constraints} \\ \textit{c-cont} & \end{bmatrix}$$

The HOOK provides the local top for the complete structure and a semantic index, that is a nominal index or an event variable. 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 (19):[2]

[2] 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.

(19)
$$\begin{bmatrix}
\text{SYNSEM}|\text{LOC}|\text{CONT}\ \boxed{1} \\
\text{RELS}\ \boxed{2} \oplus \boxed{3} \\
\text{HCONS}\ \boxed{4} \oplus \boxed{5} \\
\text{C-CONT} \begin{bmatrix}
\text{HOOK} & \boxed{1} \begin{bmatrix} \text{IND}\ \boxed{0} \end{bmatrix} \\
\text{RELS} & \boxed{2} \left\langle \begin{bmatrix} \text{ARG0} & \boxed{0} \\ \text{RESTR} & \boxed{6} \\ \text{BODY} & \textit{handle} \\ \textit{udef-rel} & \end{bmatrix} \right\rangle \\
\text{HCONS} & \boxed{4} \left\langle \begin{bmatrix} \text{HARG} & \boxed{6} \\ \text{LARG} & \boxed{7} \\ \textit{qeq} & \end{bmatrix} \right\rangle
\end{bmatrix} \\
\text{HEAD-DTR} \begin{bmatrix}
\text{SYNSEM}|\text{LOC}|\text{CONT} \begin{bmatrix} \text{IND} & \boxed{0} \\ \text{LTOP} & \boxed{7} \end{bmatrix} \\
\text{RELS}\ \boxed{3} \left\langle \begin{bmatrix} \text{LBL} & \boxed{7} \\ \text{ARG1} & \boxed{0} \\ \textit{tired} & \end{bmatrix}, \begin{bmatrix} \text{LBL} & \boxed{7} \\ \text{ARG0} & \boxed{0} \\ \textit{squirrel} & \end{bmatrix} \right\rangle \\
\text{HCONS}\ \boxed{5}\ \langle\rangle
\end{bmatrix}
\end{bmatrix}$$

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 2 (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.*

2.4.3. Decomposition in Syntax vs. Underspecification

An interesting application of the underspecification of scope constraints is the treatment of the ambiguity of (20a).

(20) a. dass Max alle Fenster aufmachte
that Max all windows opened
'that Max opened all windows'
b. ∀ x (window(x) → CAUSE(max, open(x)))
c. CAUSE(max, ∀ x (window(x) → open(x)))

The first reading corresponds to a situation in which all windows were closed and Max opens each window and the second reading corresponds to a situation in which some windows were open already and Max opened the remaining windows which results in a situation in which all windows are open.

Egg (1999) suggests specifying the meaning of *öffnen* ('to open') in an underspecified way. (21) gives an MRS version of his analysis:

(21) ⟨ h0, { h1:CAUSE(x, h2), h3:open(y) }, { $h2 =_q h3$ } ⟩

The CAUSE operator embeds the *open′* relation, but the embedding is not direct. It is stated as a dominance constraint $h2 =_q h3$. This allows for quantifiers to scope between the CAUSE operator and the embedded predicate and therefore admits the readings in (20b,c). The analysis also extends to the readings that can be observed for sentences with adverbials like *wieder* ('again'). The sentence in (22) has three readings that originate from different scopings of CAUSE, ∀, and *wieder* ('again'):

(22) a. dass Max alle Fenster wieder aufmachte
that Max all windows again opened
b. CAUSE > ∀ > *again′* > *open′*
c. ∀ > CAUSE > *again′* > *open′*
d. ∀ > *again′* > CAUSE > *open′*

The first two readings are so-called repetitive readings and the third one is a restitutive reading. See Dowty, 1979, Section 5.6 on this phenomenon. Since only the relative scope of CAUSE and *open′* is fixed, other scope-taking elements can intervene.

With such a semantic representation the syntax-semantics interface can be set up as follows: the adverbial combines with *aufmachen* and the resulting phrase is combined with the object *alle Fenster* and the subject *Max*. The scoping of the universal quantifier and the adverbial *wieder* depends on the ordering of the elements, that is in (22a) only readings in which ∀ outscopes *again′* are available. See Kiss, 2001 for more information of the treatment of quantifier scope in German in the framework of HPSG.

Egg (1999) suggests the underspecification analysis as an alternative to von Stechow's analysis in the Minimalist Program (1996). Von Stechow assumes a decomposition in syntax in the style of Generative Semantics and relies on several empty heads and movement operations that are necessary to derive readings. As was pointed out by Jäger and Blutner (2003) the analysis does not get all attested readings. Apart from such empirical problems, the underspecification analysis has to be preferred for reasons of simplicity: the syntactic structures directly correspond to observable facts.

2.5. Lexical Rules

Since HPSG is a lexicalist theory, the lexicon plays an important role. The lexicon is not just a prison for the lawless as suggested by Di Sciullo and Williams (1987, p. 3), but is structured and lexical items are related to each other. One means of capturing generalizations is lexical rules. A lexical rule says if there is a lexical item with certain properties then there is also another lexical item with certain other properties. An example for the application of lexical rules is morphology (Pollard and Sag, 1987, Chapter 8.2, Orgun, 1996, Riehemann, 1998, Ackerman and Webelhuth, 1998, Kathol, 1999, Koenig, 1999). The HPSG lexicon (of inflecting languages) consists of roots that are related to stems or fully inflected words. The derivational or inflectional rules may influence part of speech (adjectival derivation) and/or valence (-*able* adjectives and passive). (23) is an example for a lexical rule. It was suggested by Kiss (1992) to account for the personal passive in German.[3] The rule takes as input a verbal stem that governs both a nominative and an accusative. The nominative argument is not represented in the COMPS list of the output. The case of the object is changed from *acc* to *nom*. The remaining arguments (if there are any) are taken over from the input ($\boxed{3}$).

(23) Lexical rule for the personal passive following Kiss (1992):

$$\begin{bmatrix} \textsc{phon}\ \boxed{1} \\ \textsc{synsem}|\textsc{loc}|\textsc{cat} \begin{bmatrix} \textsc{head} & \textit{verb} \\ \textsc{subcat} & \left\langle \text{NP}[\textit{nom}],\ \text{NP}[\textit{acc}]_{\boxed{2}} \right\rangle \oplus \boxed{3} \end{bmatrix} \\ \textit{stem} \end{bmatrix} \mapsto$$

$$\begin{bmatrix} \textsc{phon}\ f(\boxed{1}) \\ \textsc{synsem}|\textsc{loc}|\textsc{cat} \begin{bmatrix} \textsc{head} & \begin{bmatrix} \textsc{vform}\ \textit{passive-part} \end{bmatrix} \\ \textsc{subcat} & \left\langle \text{NP}[\textit{nom}]_{\boxed{2}} \right\rangle \oplus \boxed{3} \end{bmatrix} \\ \textit{word} \end{bmatrix}$$

The stem is mapped to a word and the phonology of the input ($\boxed{1}$) is mapped to the passive form by a function f.

During the past decades there has been some discussion concerning the status of lexical rules. One way to formalize them is to fully integrate them into the formalism of typed feature structures. According to this view the input of the lexical rule is a daughter of the output (Krieger and Nerbonne, 1993a, Chapter 7.4.1; Copestake and Briscoe, 1992; Meurers, 1995, 2001; Riehemann, 1998). This is basically equivalent to a unary branching immediate dominance rule. (24) shows the lexical rule in (23) in a format that directly reflects this approach.

[3] For a more general passive rule that unifies the analyses of personal and impersonal passives see Müller, 2002, Chapter 3. This more general rule for the passive uses the distinction between structural and lexical case.

(24) Lexical rule for the personal passive (fully integrated into the formalism):

$$\begin{bmatrix} \textsc{phon}\ f(\boxed{1}) \\ \textsc{synsem}|\textsc{loc}|\textsc{cat} \begin{bmatrix} \textsc{head} & \begin{bmatrix} \textsc{vform}\ \textit{passive-part} \end{bmatrix} \\ \textsc{subcat} & \left\langle \text{NP}[\textit{nom}]_{\boxed{2}} \right\rangle \oplus \boxed{3} \end{bmatrix} \\ \textsc{lex-dtr} \begin{bmatrix} \textsc{phon}\ \boxed{1} \\ \textsc{synsem}|\textsc{loc}|\textsc{cat} \begin{bmatrix} \textsc{head} & \textit{verb} \\ \textsc{subcat} & \left\langle \text{NP}[\textit{nom}],\ \text{NP}[\textit{acc}]_{\boxed{2}} \right\rangle \oplus \boxed{3} \end{bmatrix} \\ \textit{stem} \end{bmatrix} \\ \textit{acc-passive-lexical-rule} \end{bmatrix}$$

A further advantage of this notation is that lexical rules are constraints on typed feature structures and as such it is possible to integrate them into an inheritance hierarchy and to capture generalizations over various linguistic objects.

For instance it was argued by Höhle (1997) that complementizers and finite verbs form a natural class in German.

(25) a. dass Karl das Buch liest
that Karl the book reads
'that Karl reads the book'

b. Liest Karl das Buch?
reads Karl the book
'Does Karl read the book?'

In head-movement-inspired approaches (see Borsley (1989) for a head-movment approach for English, Müller and Ørsnes, To appear for a head-movment approach for Danish, and Kiss and Wesche, 1991; Kiss, 1995; Meurers, 2000; Müller, 2008 for head-movement approaches for German) the verb in (25b) is related to a lexical item for the verb as it occurs in (25a) by a lexical rule. The complementizer and the lexical rule are subtypes of a more general type capturing the commonalities of *dass* in (25a) und *liest* in (25b).

2.6. Generalizations

HPSG is a theory that places a lot of information in the lexicon. For instance lexical entries of verbs contain detailed descriptions of their arguments, they contain information on how arguments are linked to the semantic contribution of the verb, information about semantic roles and so on. A good way to capture generalizations with respect to this lexical knowledge is to use type hierarchies with multiple inheritance (Pollard and Sag, 1987, Chapter 8.1). Sag (1997) argued for several different immediate-dominance schemata for variants of English relative clauses and modified the feature geometry of HPSG in a way that made it possible to capture the generalizations over the various schemata in an inheritance hierarchy. Figure 2.12 on the facing page gives an example of how (parts

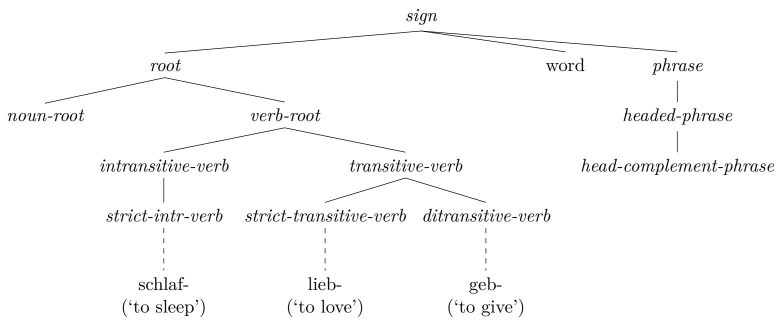

Figure 2.12.: Part of an inheritance hierachy that contains lexical entries and immediate dominance schemata

of) an inheritance hierarchy that includes both lexical and phrasal types may look. In Section 2.2.5 we discussed constraints on phrases of type *headed-phrase*. Since structures of the type *head-complement-phrase* are a subtype of *headed-phrase*, they inherit all the constraints from their supertype. Hence, head features at the mother node of a head complement phrase are identified with the head features of the head daughter. Similarly the constraint that there is an nominative and an accusative object is represented at the type *transitive-verb*. The type *strict-transitive-verb* adds the information that there is no further argument and the type *ditransitive-verb* adds the information about an additional dative argument.

A. List of Phrases Covered/Rejected by the Grammar

idiom + light verb construction

(1) او مرد را دوست داشت.
U mard rā dust dāšt.
he/she man DOM friend had
'He/she loved the man.'

(2) * او علی را مرد داشت.
U Ali rā mard dāšt.
he/she Ali DOM man had

incorporation + light verb construction

(3) علی تلفن کرد.
Ali telefon kard.
Ali telephone did.
'Ali called.'

causative + light verb construction

(4) من رادیو باز کردم.
Man rādiyo bāz kardam.
I radio open do.
'I opened the radio.'

causative + light verb construction + future

(5) من رادیو باز خواهم کرد.
Man rādiyo bāz xāham kard.
I radio open will do.
'I will open a radio.'

(6) * من رادیو خواهم باز کرد.
* Man rādiyo xāham bāz kard.
I radio will open do.
'I will open a radio.'

(7) من کتاب خواهم بر داشت.
Man ketāb xāham bar dāšt.
I book will PART had
'I will take a book.'

(8) من کتاب بر خواهم داشت.
Man ketāb bar xāham dāšt.
I book PART will had
'I will take a book.'

light verb construction + coordination

(9) من رادیو باز و تمیز کردم.
Man rādiyo bāz va tamiz kardam.
I radio open and clean did
'I opened and cleaned a radio.'

idiom + light verb construction + negation

(10) او مرد را دوست نداشت.
U mard rā dust nadāšt.
He/she man DOM friend NEG-have.
'He/she does not love the man.'

idiom + light verb construction + future

(11) او مرد را دوست خواهد داشت.
U mard rā dust xāhad dāšt.
He/she man DOM friend want have
'He/she will love the man.'

idiom + light verb construction + negation + future

(12) او مرد را دوست نخواهد داشت.
U mard rā dust naxāhad dāšt.
He/she man DOM friend NEG-want have
'He/she will not love the man.'

(13) * او مرد را دوست خواهد نداشت.
U mard rā dust xāhad nadāšt.
He/she man DOM friend want NEG-have
'He/she will not love the man.'

negation + passive

(14) مریم در خیابان دیده شد.
Maryam dar xiyābān dide šod.
Maryam in street seen become.
'Maryam was seen in the street.'

(15) مریم در خیابان دیده نشد.
Maryam dar xiyābān dide našod.
Maryam in street seen NEG-become.
'Maryam was not seen in the street.'

(16) * مریم در خیابان ندیده شد.
Maryam dar xiyābān nadide šod.
Maryam in street NEG-seen become.

negation + copula

(17) مریم غمگین شد.
Maryam qamgin šod.
Maryam sad become
'Maryam became sad.'

(18) مریم غمگین نشد.
Maryam qamgin našod.
Maryam sad NEG-become
'Maryam did not become sad.'

cliticization

(19) دیدم ت.
Didam at.
saw-1-sg-2sg
'I saw you'

(20) دیدم ش.
Didam aš.
saw-1-sg-3sg
'I saw him'

(21) او روشن کرد ش.
U rošan kard aš.
He/she light do DO.CL.3sg
'He/she turned it on.'

(22) او روشن ش کرد.
U rošan aš kard.
He/she light DO.CL.3sg do
'He/she turned it on.'

(23) من باز خواهم ش کرد.
Man bāz xāham aš kard.
I open want DO.CL.3sg do
'I will open it.'

(24) من باز ش خواهم کرد.
Man bāz aš xāham kard.
I open DO.CL.3sg want do
'I will open it.'

(25) من خواهم ش نوشت.
Man xāham aš nevešt.
I will DO.CL.3sg write
'I will write it.'

cliticization + possessives

(26) من مادر ش را دیدم.
Man mādar aš rā didam.
I mother-Poss-3.SG RA saw
'I saw his/her mother.'

cliticization + Ezafe + possessives

(27) کتاب بزرگ ت
ketābe bozorg at
book+EZ big+2SG
'your big book'

cliticization + possessives + ezafe

(28) کتاب م
ketāb am
book-my
'my book'

(29) کتاب من
ketābe man
book+EZ I/me
'my book'

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(30) * کتاب م
ketābe am
book+EZ-my

possessives + demonstrative determiner

(31) این کتاب مریم
in ketābe maryam
this book of Maryam

inchoative + causative + light verb construction

(32) رادیو باز شد.
Rādiyo bāz šod.
radio open became.
'The radio opened.'

(33) مادر بچه را آرام کرد.
mādar bače rā ārām kard.
mother child DOM silent make-Past
'The mother silenced the child.'

(34) بچه آرام شد.
bače ārām šod.
child silent become
'The child became silent.'

(35) بچه توسط مادر ش آرام شد.
bače tavassote mādar aš ārām šod.
child by mother-his silent become
'The child became silent by his mother.'

nominalization + light verb construction

(36) من بازی کن را دیدم.
Man bāzi kon rā didam.
I play do RA saw
'I saw the player.'

(37) من بازی کنان را دیدم
Man bāzi konān rā didam.
I play do-PL RA saw
'I saw the players.'

(38) باز کنندگان
bāz konandegān
open do-er-PL
'openers'

inchoative + verbal noun + light verb construction

(39) علی ساسان را شکست داد.
Ali Sāsān rā šekast dād.
Ali Sasan-DOM defeat GIVE-Past
'Ali defeated Sasan.'

(40) ساسان شکست خورد.
Sāsān šekast xord.
Sasan defeat COLLIDE-Past
'Sasan was defeated./ Sasan suffered defeat.'

verbal noun + inflection

(41) * اهداها
ehdāhā
giving-Pl

(42) علی کتاب را به ساسان اهدا کرد.
Ali ketāb rā be sāsān ehdā kard.
John book DOM to Sasan giving do-past
'Ali gave the book to Sasan.'

verbal noun

(43) * این اهدا
in ehdā
this giving

process noun + light verb construction

(44) علی با ساسان حرف زد.
Ali bā Sāsān harf zad.
Ali with Sasan talk BEAT-Past
'Ali talked to Sasan.'

(45) حرفهای علی با ساسان
harfhāye Ali bā Sāsān
talks-EZ Ali with Sasan
'Ali's talks with Sasan'

auxiliary placement

(46) من کتاب را نوشته بودم.
Man ketāb rā nevešte budam.
I book DOM written was-1st-Sg
'I had written the book.'

(47) * من کتاب را بودم نوشته.
Man ketāb rā budam nevešte.
I book DOM was-1st-Sg written

(48) من کتاب را خواهم نوشت.
Man ketāb rā xāham nevešt.
I book DOM will-1st-Sg wrote
'I will write the book.'

(49) * من کتاب را نوشت خواهم.
Man ketāb rā nevešt xāham.
I book DOM wrote will-1st-Sg
'I will write the book.'

(50) * من خواهم کتاب را نوشت.
Man xāham ketāb rā nevešt.
I will-1st-Sg book DOM wrote
'I will write the book.'

(51) من این کار را انجام خواهم داد.
Man in kār rā anjām xāham dād.
I this job DOM performance will-1st-Sg gave
'I will do this job.'

(52) * من این کار را انجام داد خواهم.
Man in kār rā anjām dād xāham.
I this job DOM performance gave will-1st-Sg
'I will do this job.'

(53) من این کار را انجام داده بودم.
Man in kār rā anjām dāde budam.
I this job DOM performance given was-1st.Sg
'I had done this job.'

(54) * من این کار را انجام بودم داده.
Man in kār rā anjām budam dāde.
I this job DOM performance was-1st.Sg given
'I had done this job.'

auxiliary + clitic

(55) سیب را خریده بودم.
sib rā xaride budam.
apple+rā bought was+1sgS
'I had bought the apple.'

(56) خریده بودم ش.
xaride budam aš.
bought was+1sgS+3sg
'I had bought it.'

(57) * خریده یش بودم
xaride yeš budam
bought+3sg was+1sgS

(58) کتاب را خواهم خرید.
ketāb rā xāham xarid.
book+rā want+1sgS buy
'I will buy the book.'

(59) خواهم ش خرید.
xāham aš xarid.
want+1sgS+3sg buy
'I will buy it.'

(60) خواهم خرید ش.
xāham xarid aš.
want+1sgS buy+3sg
'I will buy it.'

progressive

aspect + indicative + progressive + indefinite future

(61) می‌روم.
miravam.
Ind/Prog/Indef. Fut.-go-1sg
'I go. / I am going. / I will go.'

(62) می‌رفتم.
miraftam.
Ind/Prog
'I used to go. / I was going.'

(63) گوش می‌کنم.
guš mikonam.
ear Ind/Prog/Indef. Fut.-do-1sg
'I listened. / I am listening. / I will listen.'

(64) گوش می‌کردم.
guš mikardam.
ear Ind/Prog
'I used to listen. / I was listening.'

present + continuous incompletive

(65) من دارم می‌روم.
man dāram miravam.
I have-1sg prog-go-1sg
'I am going.'

(66) تو داری می‌روی.
to dāri miravi.
you have-2sg prog-go-2sg
'You are going.'

(67) او دارد می‌رود.
u dārad miravad.
he/she have-3sg prog-go-3sg
'He/she is going.'

past + continuous incompletive

(68) من داشتم می‌رفتم.
man dāštam miraftam.
I had-1sg prog-go-1sg
'I was going.'

(69) تو داشتی می‌رفتی.
to dāšti mirafti.
you had-2sg prog-go-2sg
'You were going.'

(70) او داشت می‌رفت.
u dāšt miraft.
he/she had-3sg prog-go-3sg
'He/she were going.'

present + continuous incompletive + complex predicate

(71) من دارم گوش می‌کنم.
man dāram guš mikonam.
I have ear Ind/Prog/Indef. Fut.-do-1sg
'I am listening.'

(72) * من دارم گوش می‌کردم.
man dāram guš mikardam.
I have ear Ind/Prog/Indef. Fut.-did-1sg

(73) من گوش دارم می‌کنم.
man guš dāram mikonam.
I ear have Ind/Prog/Indef. Fut.-do-1sg
'I am listening.'

(74) تو داری گوش می‌کنی.
to dāri guš mikoni.
you have ear Ind/Prog/Indef. Fut.-do-1sg
'I am listening.'

(75) تو گوش داری می‌کنی.
to guš dāri mikoni.
you ear have Ind/Prog/Indef. Fut.-do-1sg
'I am listening.'

(76) او دارد گوش می‌کند.
u dārad guš mikonad.
he/she have ear Ind/Prog/Indef. Fut.-do-1sg
'I am listening.'

(77) او گوش دارد می‌کند.
u guš dārad mikonad.
he/she ear have Ind/Prog/Indef. Fut.-do-1sg
'I am listening.'

(78) * من داشتم گوش می‌کنم.
man dāštam guš mikonam.
I had ear Ind/Prog/Indef. Fut.-do-1sg
'I was listening.'

(79) من داشتم گوش می‌کردم.
man dāštam guš mikardam.
I had ear Ind/Prog/Indef. Fut.-did-1sg
'I was listening.'

(80) من گوش داشتم می‌کردم.
man guš dāštam mikardam.
I ear had Ind/Prog/Indef. Fut.-do-1sg
'I was listening.'

(81) تو داشتی گوش می‌کردی.
to dāšti guš mikardi.
you had ear Ind/Prog/Indef. Fut.-do-1sg
'I was listening.'

(82) تو گوش داشتی می‌کردی.
to guš dāšti mikardi.
you ear had Ind/Prog/Indef. Fut.-do-1sg
'I was listening.'

(83) او داشت گوش می‌کرد.
u dāšt guš mikard.
he/she had ear Ind/Prog/Indef. Fut.-do-1sg
'I was listening.'

(84) او گوش داشت می‌کرد.
u guš dāšt mikard.
he/she ear had Ind/Prog/Indef. Fut.-do-1sg
'I was listening.'

definite future

(85) من خواهم رفت.
man xāham raft.
I futur-sg went.
'I will go.'

(86) تو خواهی رفت.
to xāhi raft.
you futur-sg went.
'You will go.'

(87) او خواهد رفت.
u xāhad raft.
he/she futur-sg went.
'He/she will go.'

definite future + complex predicate

(88) من گوش خواهم کرد.
man guš xāham kard.
I ear futur-sg do

'I will listen.'

(89) تو گوش خواهی کرد.
to guš xāhi kard.
you ear futur-sg do
'You will listen.'

(90) او گوش خواهد کرد.
u guš xāhad kard.
he/she ear futur-sg do
'He/she will listen.'

perfect

(91) مریم خندیده بود.
Maryam xandide bud.
Maryam laughed had
'Maryam had laughed.'

(92) مریم کتاب را خوانده بود.
Maryam ketāb rā xānde bud. ;;
Maryam book RA read has
'Maryam read the book.'

negation

(93) نمی‌روم.
nemiravam.
NEG-IND-go-1sg
'I do not go.'

(94) * نروم
neravam
NEG-go-1sg

(95) نروم
naravam
NEG-(SUBJUNCTIVE-)go-1sg

(96) نرفتم.
naraftam.
NEG-went-1sg
'I did not go.'

(97) * نداشتم نمی‌رفتم.
nadāštam nemiraftam.
NEG-Progr NEG-IND-go-1sg
'I am not not going.'

(98) * نداشتم می‌رفتم.
nadāštam miraftam.
NEG-Progr IND-go-1sg

(99) داشتم نمی‌رفتم.
dāštam nemiraftam.
Progr NEG-IND-go-1sg

negation + complex predicate

(100) گوش نمی‌کنم.
guš nemikonam.
ear NEG-IND-do-1sg
'I do not listen.'

(101) * گوش نکنم.
guš nekonam
ear NEG-do-1sg

(102) گوش نکنم.
guš nakonam.
ear NEG-(SUBJUNCTIVE-)do-1sg
'I did not listen.'

(103) گوش نکردم.
guš nakardam.
ear NEG-did-1sg
'I did not listen.'

direct object marker

(104) تو را دیدم.
to ro didam.
you+rā saw+1sgS
'I saw you.'

direct object marker + case

(105) علی فوت کرد.
Ali fowt kard.
Ali death did
'Ali died.'

(106) * علی را فوت کرد.
Ali rā fowt kard.
Ali DOM death did

(107) * علی فوت را کرد.
Ali fowt rā kard.
Ali death DOM did

agreement

(108) من خندیدم.
man xandidam.
I laughed+1sgS
'I laughed.'

(109) آنها خندیدند.
ānhā xandidand.
they laughed+3plS
'They laughed.'

(110) شما خندیدید.
šomā xandidid.
you laughed+2plS
'You laughed.'

(111) من افتادم.
man oftādam.
I fell+1sgS
'I fell.'

(112) * کتاب م افتادم
ketāb am oftādam
book+1sg fell+1sgS
'My book fell.'

(113) کتاب م افتاد.
ketāb am oftād.
book+1sg fell+3sgS
'My book fell.'

Ezafe

(114) کیف را دیدم.
kif rā didam.
bag RA saw
'I saw the bag.'

(115) * کیف را دیدم.
kife rā didam.
bag-Ez RA saw

Ezafe + noun noun

(116) کیف چرم را دیدم.
kife čarm rā didam.
bag-Ez leather RA saw
'I saw the leather bag.'

(117) * کیف چرم را دیدم.
kif čarme rā didam.
bag leather-Ez RA saw

(118) * کیف چرم را دیدم.
kife čarme rā didam.
bag-Ez leather-Ez RA saw

(119) کیف چرم بزرگ دیدم.
kife čarme bozorg didam.
bag-Ez leather-Ez big saw
'I saw a big leather bag.'

(120) کیف چرم دوست م دیدم.
kife čarme dust am rā didam.
bag-Ez leather-Ez friend+1sg RA saw
'I saw the my friend's leather bag.'

Ezafe + adjective

(121) خانه بزرگ قدیمی را دیدم.
xuneye bozorge qadimi rā didam.
house+EZ big+EZ old RA saw
'I saw the big old house.'

(122) * خانه بزرگ قدیمی را دیدم.
xuneye bozorge qadimie rā didam.
house+EZ big+EZ old+EZ RA saw

Ezafe + noun with prepositional object

(123) بحث با امید
bahs bā omid
discussion with Omid

(124) * بحث با امید
bahse bā omid
discussion-EZ with Omid

(125) بحث مریم با امید
bahse Maryam bā omid
discussion-EZ Maryam with Omid
'Maryam's discussion with Omid'

(126) * بحث مریم با امید
bahse Maryame bā omid
discussion-EZ yesterday-EZ Maryam-EZ with Omid

(127) * این کتاب
ine ketāb
this-EZ book

Ezafe + adjective with complement

(128) نگران مریم
negarāne Maryam
worry-EZ Maryam
'worried about Maryam'

(129) * حرفهای علی با ساسان
harfhāye Alie bā Sāsān
talks-EZ Ali-EZ with Sasan
'Ali's talks with Sasan'

Ezafe + light verb construction

(130) * او مرد را دوست داشت.
U mard rā duste dāšt.
he/she man DOM friend-EZ had

passive

(131) علی یک کتاب به ساسان داد.
Ali ye ketāb be sāsān dād.
Ali a book to Sasan gave
'Ali gave a book to Sasan.'

(132) یک کتاب به ساسان داده شد.
ye ketāb be sāsān dāde šod.
a book to Sasan given was
'A book was given to Sasan.'

passive + intransitive verb

(133) مریم با سنگ به دیوار زد.
Maryam bā sang be divār zad.
Maryam with stone to wall hit
'(Lit.) Maryam hit to the wall with a stone/stones. '

(134) * با سنگ به دیوار زده شد
bā sang be divār zade šod
with stone to wall hit.pp become

passive + complex predicate

(135) مریم به امید تهمت زد.
Maryam be Omid tohmat zad.
Maryam to Omid slander hit
'Maryam slandered Omid.'

adjective

(136) * علی بزرگ.
Ali bozorg.
Ali big

participle + passive + attributive

(137) * مرد دویده
marde davide
man-EZ run.PAST

(138) مرد در بسته.
marde dar baste
man-EZ door closed
'a man who has closed doors'

(139) مرد افتاده آمد.
marde oftāde āmad.
man-EZ fall + -ed came
'a fallen man came.'

(140) در بسته شد.
dar baste šod.
door closed became
'The door was closed.'

(141) درهای بسته
darhāye baste
door-PL-EZ closed
'the closed doors'

(142) مرد شکست خورده آمد.
marde šekast xorde āmad.
man-EZ defeat + COLLIDE + -ed came
'A conquered man came.'

(143) ستایش علی را کردم.
setāyeše Ali rā kardam.
praise-EZ Ali-DOM did
'I praised Ali.'

sentantial complement

(144) می‌دانم که کیمیا این فیلم را دید.
midunam ke Kimiyā in film ro did.
DUR-know-1sg that Kimiyā this movie-DOM saw.3sg
'I know that Kimiyā has seen this movie.'

nonlocal dependency

(145) کیمیا می‌دانم که این فیلم را دید.
Kimiyā midunam ke in film ro did.
Kimiyā DUR-know-1sg that this movie-DOM saw.3sg
'As for Kimiyā, I know that she has seen this movie.'

(146) این فیلم را می‌دانم که کیمیا دید.
in film ro midunam ke Kimiyā did.
this movie-DOM DUR-know-1sg that Kimiyā saw.3sg
'As for this movie, I know that Kimiyā has seen it.'

(147) به کیمیا من فکر می‌کنم که آرزو آن کتاب را داد.
be Kimiyā man fekr mikonam ke Ārezu un ketāb ro dād.
to Kimiyā I thought DUR-do-1sg that Arezu that book-DOM gave.3sg
'To Kimiyā I think that Arezu has given that book.'

(148) تو سینما فکر می‌کنم کیمیا را دید.
tu sinamā fekr mikonam Kimiyā ro did.
in cinema thought dur-do-1sg Kimiyā RA saw
'It was in the cinema that I think she saw Kimiyā.'

weather verbs

(149) دیروز باران آمد.
diruz bārun āmad.
yesterday rain came-3sg
'Yesterday, it rained.'

i-derivation

(150) جاهای دیدنی می‌دانم.
jāhāye didani midunam.
place-pl-ez see-i dur-know-1sg
'I know places that are worth visiting'

(151) کتاب فروختنی می‌بینم.
ketābe foruxtani mibinam.
book-ez sell-i dur-see-1sg
'I see a book (which is) for sale'

(152) این مهمانهای رفتنی
in mehmānhāye raftani
this guest-pl-EZ go-i
'These guests which seem to intend to leave.'

i-derivation + negation + copula

(153) این مهمانها رفتنی نیستند.
In mehmānhā raftani nistand.
this guest-pl go-i NEG-are
'These guests do not seem to intend to leave.'

coordination

(154) علی و مریم تلفن کردند.
Ali va Maryam telefon kardand.
Ali and Maryam telephone did-PL.
'Ali and Maryam called.'

(155) علی تلفن کرد و فوت کرد.
Ali telefon kard va fowt kard.
Ali telphone did and die did
'Ali called and died.'

(156) علی مرد را دید و خندید.
Ali mard rā did va xandid.
Ali man RA saw.3sg and laughed.3sg
'Ali saw a man and laughed. / and he laughed.'

(157) علی مرد را دید و خندیدم.
Ali mard rā did va xandidam.
Ali man RA saw.3sg and laughed.1sg
'Ali saw a man and I laughed.'

coordination + case syncretism

coordination + agreement

(158) * علی و مریم تلفن کرد .
Ali va Maryam telefon kard.
Ali and Maryam telephone did-SG.

relative clause

(159) زنی که من دوست دارم خندید.
zani ke man dust dāram xandid.
woman-RESTR COMP I like laughed
'the woman that I love laughed'

(160) * زنی من دوست دارم
zani man dust dāram
woman-RESTR I like

(161) مردی که زن را دید خندید.
mardi ke zan rā did xandid.
man-RESTR COMP woman RA saw laughed
'the man who saw the woman laughed'

(162) مردی که شما دیدید خندید.
mardi ke šomā didid xandid.
man-RESTR COMP you-2PL saw-2PL laughed
'the man whom you saw laughed'

(163) این مردی که شما دیدید خندید.
in mardi ke šomā didid xandid.
this man-RESTR COMP you-PL saw-2PL laughed
'this man whom you saw laughed'

(164) فیلمی که می‌دانم کیمیا دید غمگین است.
filmi ke midunam Kimiyā did qamgin ast.
movie-RESTR COMP DUR-know-1sg that Kimiyā saw sad is
'The movie whom I know that Kimiyā has seen is sad.'

noun with sentential argument

(165) این گزارش که علی خندید دروغ بود.
in gozāreš ke Ali xandid duruq bud
this report that Ali laughed lie was
'This report that Ali laughed was a lie.'

relative clause + noun with sentential argument

(166) گزارشی که علی خندید که دیدم جالب بود.
gozāreši ke Ali xandid ke didam jāleb bud.
report-RESTR COMP Ali laughed COMP see-1SG interesting was
'The report that Ali laughed which I saw is intersting.'

(167) گزارشی که دیدم که علی خندید جالب بود.
gozāreši ke didam ke Ali xandid jāleb bud.
report-RESTR COMP see-1SG COMP Ali laughed interesting was
'Intended: The report which I saw that ALi laughed is interesting.'

relative clause + resumptive pronoun

(168) مردی که زن او را دید خندید.
mardi ke zan u rā did xandid.
man-RESTR COMP woman RESUMP RA saw laughed
'the man whom the woman saw laughed.'

(169) مردی که پیراهن او سبز است خندید.
mardi ke pirāhane u sabz ast xandid.
man-RESTR COMP shirt-EZ his-RESUMP green be laughed
'The man whose shirt is green laughed.'

(170) * مردی که پیراهن سبز هست
mardi ke pirāhane sabz hast
man-RESTR COMP shirt-EZ _ green be

(171) * مردی که پیراهن سبز هست
mardi ke pirāhan sabz hast
man-RESTR COMP shirt _ green be

(172) * مردی که او زن را دید
mardi ke u zan rā did
man-RESTR COMP RESUMP woman RA saw

(173) مردی که شما دیروز از او پول گرفتید خندید.
mardi ke šomā diruz az u pul gereftid xandid.
man-RESTR COMP you yesterday from him money took laughed
'The man from whom you took money yesterday laughed.'

relative clause + resumptive pronoun + coordination

(174) مردی که شما او را دیدید و به او پول دادید خندید.
mardi ke šomā u rā didid va be u pul dādid xandid.
man-RESTR COMP you him RA saw did-2PL and to him money gave-2PL laughed
'the man whom you saw and gave money to laughed.'

(175) مردی که پیراهن او سبز بود و شما به او پول دادید خندید.
mardi ke pirāhane u sabz bud va šomā be u pul dādid xandid.
man-RESTR COMP shirt-EZ his-RESUMP green was and you-2PL to him money gave laughed
'The man whose shirt was green and to whom you gave money laughed.'

coordination + syncretism

(176) مردی که شما ملاقات کردید و کتاب خرید خندید.
mardi ke šomā molāqāt kardid va ketāb xarid xandid.
man-RESTR COMP you visit did and book bought laughed
'The man that you visited and who bought a book laughed.'

free relative clauses

(177) مریم هرچی علی خریده بود را برداشت.
Maryam harči Ali xaride bud rā bar dāšt.
Maryam whatever Ali bought has RA took
'Maryam took whatever Ali had bought.'

(178) * پیراهن هرکی کثیف بود را اخراج کرد.
pirāhane harki kasif bud ro exrāj kard.
shirt-EZ whoever dirty was RA fire did
'He fired the shirt of anyone who was dirty.'

(179) هرکی پیراهن ش کثیف بود را اخراج کرد.
harki pirāhan eš kasif bud ro exrāj kard.
whoever shirt-EZ-he dirty was RA fire did
'He fired whoever's shirt was dirty.'

(180) هرکی آمد و به ش پول دادیم خندید.
harki āmad va be š pul dādim xandid.
whoever came and to=3SG money gave-1sg laughed-3sg
'Whoever came and we gave money to (*him) laughed.'

(181) مریم هرکی من با ش حرف زدم دوست دارد.
Maryam harki man bā š harf zadam dust dāre.
Maryam whoever I with=3SG word hit friend have
'Maryam likes whoever I talk with.'

(182) .

extraction + resumptives

(183) * کیمیا می‌دانم که او این فیلم را دید.
Kimiyā midunam ke u in film ro did.
Kimiyā DUR-know-1sg that she this movie-DOM saw.3sg
'As for Kimiyā, I know that she saw this movie.'

(184) * کیمیا می‌دانم که این فیلم را دیده ش.
Kimiyā midunam ke in film ro did eš.
Kimiyā DUR-know-1sg that this movie-DOM saw.3sg=3SG
'As for Kimiyā, I know that she saw this movie.'

(185) این مرد را می‌دانم که کیمیا او را دید.
in mard ro midunam ke Kimiyā u rā did.
this man-DOM DUR-know-1sg that Kimiyā him RA saw.3sg
'As for this man, I know that Kimiyā saw him.'

(186) این مرد را می‌دانم که کیمیا دیده ش.
in mard ro midunam ke Kimiyā did eš.
this man-DOM DUR-know-1sg that Kimiyā him RA saw=3sg
'As for this man, I know that Kimiyā saw him.'

(187) او را می‌دانم که کیمیا دیده ش.
u ro midunam ke Kimiyā did eš.
he-DOM DUR-know-1sg that Kimiyā him RA saw.3sg
'As for him, I know that Kimiyā saw him.'

(188) * این مرد می‌دانم که کیمیا دید ش.
in mard midunam ke Kimiyā did eš.
this man DUR-know-1sg that Kimiyā him RA saw.3sg
'As for this man, I know that Kimiyā saw him.'

(189) * او میدانم که کیمیا دید ش.
u midunam ke Kimiyā did eš.
he DUR-know-1sg that Kimiyā him RA saw.3sg
'As for him, I know that Kimiyā saw him.'

(190) او را دیدم ش.
u rā didam aš.
he-DOM_i saw.1SG him_i
'I saw him.'

(191) * او دیدم ش.
u didam aš.
he_i saw.1SG him_i

(192) به کیمیا من فکر می‌کنم که آرزو به او آن کتاب را داد.
be Kimiyā man fekr mikonam ke Ārezu be u un ketāb ro dād.
to Kimiyā I thought DUR.do.1sg that Arezu to her that book-DOM gave.3sg
'To Kimiyā I think that Arezu has given that book.'

(193) ? کیمیا من فکر می‌کنم که آرزو به او آن کتاب را داده.
Kimiyā man fekr mikonam ke Ārezu be u un ketāb ro dād.
to Kimiyā I thought DUR-do-1sg that Arezu that book-DOM gave

'To Kimiyā I think that Arezu has given that book.'

questions

(194) تو فکر می‌کنی مریم با کی حرف زد؟
to fekr mikoni Maryam bā ki harf zad?
you think do Maryam with who talk did
'Who do you think that Maryam talked to?'

(195) تو با کی فکر می‌کنی مریم حرف زد؟
to bā ki fekr mikoni Maryam harf zad?
you with who think do Maryam talk did
‘Who do you think that Maryam talked to?’

(196) با کی تو فکر می‌کنی مریم حرف زد؟
bā ki to fekr mikoni Maryam harf zad?
with who you think do Maryam talk did
‘Who do you think that Maryam talked to?’

(197) اگر علی مریم را ببیند عالی می‌شود.
agar Ali Maryam rā bebinad, āli mišavad.
if Ali Maryam RA SUBJUNCTIVE.see.3sg PRO great IMPF.be.3sg
‘If Ali sees Maryam, this would be great.’

adjective + negation

(198) مرد ناآرام
marde nāārām
man-EZAFE NEG.patient
‘the impatient man’

comaprative

(199) خانه بزرگ
xuneye bozorg
house.EZAFE big
‘the big house’

(200) خانه بزرگتر
xuneye bozorgtar
house.EZAFE bigger
‘the bigger house’

(201) * بزرگ خانه
* bozorg xune
big house

(202) * بزرگ خانه
* bozorge xune
big.EZAFE house

(203) * بزرگ خانه من
* bozorge xuneye man
big.EZAFE house my
‘my bigger house’

(204) * بزرگتر خانه
bozorgtar xune
bigger house

(205) خانه بزرگتر از خانه علی
xuneye bozorgtar az xuneye Ali
house.EZAFE bigger than house Ali
‘the house which is bigger than Ali’s house’

superlative

(206) بزرگترین خانه
bozorgtarin xune
biggest house
‘the biggest house’

(207) این بزرگترین خانه
in bozorgtarin xune
this biggest house
‘this biggest house’

(208) * خانه بزرگترین
xuneye bozorgtarin
house.EZAFE biggest

(209) * بزرگترین خانه
bozorgtarine xune
this biggest house
‘this biggest house’

(210) بزرگترین خانه
bozorgtarine xuneye
the biggest houses
‘the biggest houses’

participle adjectives

(211) لیوان شکسته
livāne šekaste
glass.EZ broken
‘the broken glass.’

yes/no questions

(212) آیا علی را دیدی؟
āyā Ali rā didi?
INT Ali RS saw
'Did you see Ali?'

noun to adjective derivation

(213) کتاب ایرانی را دید.
ketābe irāni rā did.
book.EZ America.Adj RA saw
'I saw the Iranian book / I saw the book of the Iranian'

(214) کتاب آمریکایی را دید.
ketābe āmrikāyi rā did.
book.EZ America.Adj RA saw
'I saw the American book / I saw the book of the American'

(215) این آمریکایی را دید.
in āmrikāyi rā did.
this American RA saw
'I saw this American (person from America).'

(216) ایرانیها را دید.
irānihā rā did.
Iranian.PL RA saw
'I saw an Iranians.'

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Namensverzeichnis

Verzeichnis der Sprachen

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